The 9th National Research Conference

on

Public Sector Transformation and Development

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Ethiopian Civil Service University

Proceedings of

The 9th National Research Conference

on

Public Sector Transformation and Development

Edited By:
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Layout and Design:
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The 9th National Research Conference on Public Sector Transformation and Development, Ethiopian Civil Service University, June 03 -04, 2024

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Table of Contents

Message from the Vice President for Research & Partnership

Ethiopian Civil Service University (ECSU) was established to support the transformation drive of building capacity of the public sector both at federal and regional levels through providing specialized education, training, research and consultancy programs and services. The University has been organizing scientific forums such as workshops and conferences with the aim of disseminating scientific research outputs and enriching the same to maintain its quality at different times.

Against this backdrop, the conference is organized under the theme 'The Seventh National Research Conference on Public Sector Transformation and Development.' A total of 95 research papers were collected by the 9th national research conference organizing committee. Of these, 55 were collected from over 12 higher education and training institutions, while 40 were funded by ECSU in the 2015 E.C. (2022-2023) calendar year. Passing through rigorous review process, of the95 papers, 40 were successfully recommended for conference representation (13 from outside and 27 from ECSU). The papers primarily were considered since they are directly related to the ECSU research thematic areas and believed to address problem-solving inquiries. The papers are categorized into the following sub-thematic areas,

Thematic Areas Distribution

Sub themes	**Freq.**
Economy & Development	12
Urban Governance, Diplomacy, Peace & Development	5
HRM& Public Service Delivery	9
Leadership&Development	3
Environment & Development	8
Cross-cutting	5
Grand Total	**42**

Of the 40 papers presented at the Conference, 15 under two themes are included in this volume, consisting of papers theme 1: in urban governance, diplomacy, peace & development economy and development and them 2: economy and development.

Dr. Alemayehu Debebe

July 2024

3. HRM, LEADERSHIP & DEVELOPMENT

3.1. Strategic Planning Practices and Accountability for Accomplishment in Ethiopian Public Sector Organizations

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Abstract

In the current globalized, highly competitive and continuously changing environment, countries all over the world have been reforming the public sector to meet increasing citizens' demand. In this regard, strategic planning and accountability have become the most important elements of public sector performance. However, the implementation and accountability for accomplishment are not well investigated and empirically validated in the public sector. Based on this rationale, this has examined the current practice of strategic planning and the effect of strategic plan implementation on organizational performance. The study also assessed the factors affecting the implementation of strategic plan. To achieve these objectives, the research adopted a concurrent mixed research approach with descriptive and explanatory research designs. Data was collected from 585 randomly selected research participants working in Addis Ababa and Federal Public sector organizations. Both descriptive (mean, standard deviation, percent and frequency) and inferential statistics (correlation and regression) were used to analyze the data and produce meaningful results. Consequently, the findings of the data confirmed that, the practice of strategic planning (formulation) was found to be at a moderate level. There is moderate and weak level of strategy implementation and evaluation in the public sector. Culture, leadership and communication were the major factors affecting strategic planning. Organizational structure has produced insignificant result regarding the factors affecting strategy implementation. Strategic planning has a positive and significant effect on organizational performance. Additionally, it was found that, accountability system for accomplishments is not strong enough. Based on the findings of the study, it was recommended that, public sector organizations at Addis Ababa and Federal level need to install strong accountability system to hold responsible bodies accountable for failure to achieve the desired result. Additionally, it is also important to design appropriate organizational structure that will foster the effective implementation of strategic plans in the public sector. Strong monitoring and evaluation systems need to be designed and installed to facilitate the effective implementation of strategic plans.

Key Words: *Accountability, Strategy, Strategic plan, Performance*

Introduction

The world is under continuous pressure from internal and external forces. Globalization, technological changes, economic shocks, financial crises, quality issues, demographic conditions and productivity are the major factors that push organizations everywhere. Governments in the globe are forced to implement different reform tools in order compete in continuously changing environment and meet citizen's demand. Recently the public sector is becoming aware of the

importance of designing long term policies, strategies and programs to be viable and achieve developmental goals of the country. All these can be categorized under planning practice which also encompasses strategic planning (Bryson, Edwards, & Van Slyke, 2018).

Strategic planning is defined as a systematic process for managing the organization and its future direction in relation to its environment and the demands of external stakeholders, including strategy formulation, analysis of strengths and weaknesses, identification of agency stakeholders, implementation of strategic actions, and issue management (Jayawarna & Dissanayake, 2019).

Strategy and strategic planning are useful tools for organizations to achieve short- and long-term goals. In this regard, the implementation of strategic plans within the time frame plays a significant role. However, implementation without accountability is not sufficient. Therefore, the accomplishments of the goals and objectives stated in the strategic plan should reviewed and evaluated in turn any failure to meet the defined short term and long term goals should be attached with accountability (Obeidat, Al-Hadidi, Tarhini, & Masa'deh, 2017).

In this context some previous empirical evidence demonstrated that, there is a significant performance difference between organizations which follow a formal strategic planning process and which don't, depending on the environment confronting the organizations. Moreover, it has been also found that most strategic plan implementation fails due to failure to link with budget, with employee reward systems, lack of leadership support and commitment and lack of communication with stakeholders.

Strategic management is widely seen as essential to the public services, leading to better performance and better outcomes for the public. In fact, the private sector idea of strategic management has become so powerful in the public sector that politicians and policymakers have begun to talk about the importance of the modern state being strategic. In the last fifteen years, strategic planning and management have become widely accepted as ways of modernizing public policymaking and modernizing government. They have become very important for governments and public sector organizations all around the world. Those engaged in public management in whatever capacity, as politician or as professional civil servant or public manager, need to understand them and know how to use them (Joyce, P., 2015).

Strategic planning and accountability have become the most important elements of public sector performance. In this regard, strategic planning should be clearly linked with implementation and control. Based on the implementation results, there should be accountability mechanisms for any failure in meeting the desired results. In this regard, strategic management (SM) and strategic planning have become prominent on the agenda in several public organizations due to new public management (NPM) reforms. Nevertheless, there are few studies investigating how public organizations apply strategic planning and management in practice and what tools are used. As a result, calls have been made for such studies (Hoglund, Holmgren Caicedo, Martensson, & Svardsten, 2018).

Over the past two decades, the strategic management has become a common management tool in both developed and developing countries. Much have been written and published in the field of strategy and consequently on strategic planning. Over the past two decades research has increasingly identified the pitfalls of strategic management practices. In addition, strategic management practices and its link to organizational performance have led to inconclusive findings and have made a synthesized stream of research difficult to achieve (Ketema, 2015).

Moreover, most theory and practices have been focused on the private sector, specifically in businesses and for the purpose of improving competitive position in the market. Strategic management for public organizations is a more recent innovation and isn't well investigated area

in the public sector. It has steadily grown as an academic endeavor and tool for public managers but is not nearly as robust as its private sector predecessor. Only few empirical research is conducted in the public sector in the Ethiopian context. Thus, there is still a need to conduct empirical research that demonstrates the relationship between strategic management practices and organizational performance.

Hence, in the current dynamic and continuously changing global environment, countries all over the world have been reforming the public sector to meet increasing citizens' demand. Particularly, developing countries including Ethiopia have been developing long term country wide strategic plans. These strategic plans are under the major theme of strategic management practice. Based on this general plan, each public sector is responsible to cascade based on its own specific mission and vision. Due to these facts, this research examined Strategic Planning Practices and Accountability for Accomplishment in Ethiopian Public Sector. Hence, the research tried to address the current practices of strategic planning and implementation in selected public sector organizations. The major challenges affecting strategic management were also identified in the research.

Research Questions

1. What is the current practice of strategic plan in the public sectors?
2. What is the relationship between accountability and strategic plan implementation?
3. What factors affect the effective implementation of strategic plan in the public sectors?
4. What is the effect of strategic plan implementation on the performance of public sector organizations?
5. What are the major challenges of strategic planning in the public sector?

Literature Review

In the last two decades, the issue of strategy and strategic planning has attracted much attention from academia and practitioners. Successfully designed and implemented strategy and strategic planning can influence the organization's bottom line. Thus, having a strategic plan is the best way to bring focus and direction to every type of organization, whether it is public or private. Strategic planning is long range process that determines the organization's future direction in terms of its product, services, competition and customers. Hence, a well-crafted plan can provide the road map to success and let every individual know how they can contribute to the results. The planning process itself can be a great contributor to the development of new ideas and competitive insights, develop the process of buy-in and management commitment, and be an integral part of the communications and mobilization effort. Consequently, in the following sections, theoretical review related with strategic planning is reviewed in detail.

The Nature of Strategic Planning

Before discussing the nature of strategic planning, it is paramount to say something about strategy. The word strategy means "general" in Greek and, in a military sense, is linked to the planning of battles and military campaigns. It differs from tactics, which refers to more limited planning to achieve immediate objectives. Though people continue to argue about the meaning of "strategy" in a business setting, most would probably agree that it has to do with long-term, large-scale plans for future-oriented, competitive success. Strategic issues are mostly the concern of top managers. These issues involve allocation of organizational resources. Generally speaking, strategy is the process of consciously choosing to be clear about the organization's future direction in relation to what's happening in the dynamic environment (Joyce, 2015).

Strategic planning determines the long-term viability and health of the organization. For this reason, the development of strategic plan requires involvement and commitment of top-level leaders or key decision makers, and eventually all managers, employees and relevant stakeholders. The strategic plan articulates the fundamental mission and long-term goals and objectives for the Mission Area and identifies specific strategies and performance targets to achieve these goals. The strategic plan serves as a blueprint for performance and business plans created at all levels of the organizational mission areas.

The term strategic planning refers to a coordinated and systematic process for developing a plan for the overall direction of your endeavor for the purpose of optimizing future potential. Strategic planning is a process that focuses on strategic and operational goals, objectives and strategies based on organizational policies, programs and activities that are designed to achieve the institution's aims and desirable results (Hughes, 2003). A strategic plan serves as a blueprint for an agency's budget formulation, and becomes the foundation for resource allocation, performance planning, business plans, and performance measurement. A strategic plan provides the criteria for making day-to-day and long-term organizational decisions and provides a template against which decisions can be evaluated. According to Geiss (2003), strategic planning is long-range planning. However, it goes beyond just the aspect of long-range planning for an organization to develop a process whereby the organization looks at its resources and the environment and then tries to determine where the organization should be going in the next three-to-five-year time frame.

The Strategic Planning Process

Strategic planning is one of the most important responsibilities of the senior management of an organization. It is the vehicle that senior management should use to set the organizational vision, determine the strategies required to achieve that vision, make the resource deployment decisions to achieve the selected strategies, and build alignment to the vision and strategic direction throughout all levels of the organization. Strategic planning is a process that helps an organization allocates its resources to capitalize on opportunities in the marketplace. Typically, it is a long-term process. The strategic planning process includes conducting a situation analysis and developing the organization's mission statement, objectives, value proposition, and strategies.

Strategic Planning and Accountability

Strategic planning and accountability are two inseparable elements in organizational setting. Organizational members including employees and top-level managers should be accountable for organizational goals and objectives achievement.

Accountability refers to "the principle that individuals, organizations and the community are responsible for their actions and may be required to explain them to others" (Benjamin et al., 2006). Organizational accountability is about defining the company's mission, values, and goals, as well as everyone's role in working toward them. It's about holding employees and executives responsible for accomplishing these goals, completing assignments, and making decisions that deliver on these expectations. Organizational accountability occurs when all employees behave in a way that promotes the successful and timely completion of their responsibilities. Creating a culture of organizational accountability doesn't happen overnight though.

Strategic Plan Implementation

Strategy implementation will affect the organization, especially on service companies which have different nature than other kinds of organizations. According to Thompson et al. (2007) the notion of strategic plan implementation has been supported by all sectors in the world due to its apparent

contribution to effectiveness of organizations performance currently, private, public and third sector have taken seriously the need for having a strategic plan as a tool for improving organization performance.

Strategic plan implementation is an active component of the strategic management process, which entails strategy formulation, implementation, monitoring and control. Implementation involves setting ideas into achievement the logically developed strategies, (Shah, 1996). Strategy implementation process includes: the ability to realize the organizations strategy; administrative support and information systems; provision of financial and other resources necessary for plans, strategies for creating a favorable climate and support agreements; operational guidance on key strategic performance targets, adequate management style and climate formation (Dzemyda, 2014).

According to Pfeffer and Salancik, (2018) strategic plan implementation could potentially enable public service organizations to better manage the support from stakeholders that is needed to achieve strategic objectives. This is especially important in the public sector, since the context in which public organizations operate has a massive influence on organizational behavior and outcomes (O'Toole & Meier, 2016).

In particular, the ways in which public organizations respond to stakeholders has become increasingly important as those organizations have needed to do more to collaborate and co-operate with the diverse actors who have a stake in the process of implementation and formulation of strategic plan (Osborne, 2016). It is thus obvious that strategy implementation is a key challenge for today's organizations. There are many (soft, hard and mixed) factors that influence the success of strategy implementation, ranging from the people who communicate or implement the strategy to the systems or mechanisms in place for co-ordination and control.

Methodology

Research Design and Approach

Research design is a general framework to undertake any scientific inquiry. Thus, in this research a concurrent mixed research approach will be utilized. Concurrent mixed research approach which involves the collection and analysis of both qualitative and quantitative data at the same time or in parallel. Based on this research approach, descriptive and explanatory designs will be used to assess the practice of strategic planning, identify the challenges and examine any cause-and-effect relationships between research variables.

Sampling Design

In this study both probability and non-probability /purposive/ sampling techniques will be applied. The probability sampling technique will be used to collect quantitative data through self-administered survey questionnaires, whereas non-probability (purposive) sampling technique will be used to collect qualitative data through semi-structured interview.

In this research a multi-stage sampling technique will be applied to divide the research sites into two research sites (Federal and Addis Ababa City). Multi-stage is a sampling technique which is useful to choose a limited number of smaller geographic areas in which simple or systematic random sampling can be conducted.

Finally, to select participants for the survey questionnaires a sample size was determined. Since to total population of the study is unknown, the sample size of the study was determined by using the formula suggested by Cochran (1977).

$$n = \frac{z^2 pq}{e^2}$$

Where:

- e is the desired level of precision (i.e. the margin of error)
- p is the (estimated) proportion of the population which has the attribute in question,
- q is 1 – p.

$$n_x = \frac{1.96^2\ (0.5)(1-0.5)\ ^2}{(0.05)^2} = 384 \quad \rightarrow \quad \text{Addis Ababa}$$

$$n_x = \frac{1.96^2\ (0.5)(1-0.5)\ ^2}{(0.05)^2} = 384 \quad \rightarrow \quad \text{Federal}$$

Data types, sources and collection techniques

In this research both qualitative and quantitative data types will be collected simultaneously. Primary and secondary data sources will be used as major sources of data for the research. Self-administered survey questionnaires and key informant interviews will be used as primary data sources. On the other hand, reports, strategic plans and other relevant organizational documents will be used as secondary data sources.

Both qualitative and quantitative data collection methods will be used in this research. To collect quantitative data, self-administered survey questionnaires will be used. Surveys allow statistical inferences to be made in relation to the broader population of interest and thus allow generalizability to be made and this in turn will increase the external validity of the research. Moreover, semi-structured interview will be also used to collect qualitative data from purposefully selected key informants. Semi-structured interviews involve a mix of 'open' and 'closed' questions and the questions are planned but flexible.

Data Analysis Procedures

Different data analysis techniques will be employed in this research project. Both quantitative and qualitative data analysis techniques will be used in this study to confirm the results with prior empirical and theoretical reviews. As a result, both inferential and descriptive statistics will apply for quantitative data analysis. Descriptive statistical analysis will be used to describe the current practice of strategic planning, to identify the major challenges that impede the implementation of strategic plans and identify the major challenges of strategic planning. On the other hand, inferential statistics will be used in order establish cause and effect relationship between research variables. In this regard, correlation and regression analysis will be used as inferential statistical techniques. Finally, thematic and narrative analysis will be used as qualitative data analysis techniques.

Validity Reliability and Ethical Issues

To establish the internal consistency (reliability) of research constructs, Cronbach's alpha coefficient and composite reliability will be used. To establish the construct validity of research constructs, both convergent and discriminant validity will be used. Additionally, all ethical principles were maintained during data collection and analysis.

Results and Discussions

Demographic Characteristics of Respondents

Table 1: Demographic Distribution of Respondents

Variables	Category	Frequency	Percent (%)	
Gender	Male	299	51.1	
	Female	286	48.9	
Education	Certificate/ Diploma	143	24.4	
	Degree	376	64.3	
	Masters	66	11.3	
	Mean	**SD**	**Minimum**	**Maximum**
Age	35.6598	8.70358	22.00	64.00
Experience	9.6701	6.47113	1.00	38.00

Table 1 above illustrates the demographic characteristics of respondents. As indicated in the table, above the gender distribution of the respondents is almost balanced with except a slight difference. Male respondents are 299 (51.1) and female counterparts are 286 (48.9%). This implies that, there is a balanced gender distribution in the public sector, which is a direction held by the government. Regarding the educational level of respondents, as it is indicated, most of the respondents are degree holders with a frequency of 376 (64.3%). 143 (24.4%) of the respondents are diploma holders. Only 66 (11.3%) of the respondents were master holders. This indicates that there is a need for upgrading the educational level of the civil servants. On the other hand, the table above demonstrates the result of descriptive statistics regarding age and experience of respondents. As per the results, the minimum and maximum age of respondents is 22 and 64 respectively. The average age is 35 years old. This implies that, there are youth/young civil servants in the public sector. In terms of work experience, the maximum is 38 years, and the minimum is 1 year with average work experience of 9 years.

Strategic Planning Practices

The first research question of this study was to examine the current strategic planning practices in the selected public sectors. Accordingly, to measure the current practices of strategic planning, eleven (11) Likert scale items were used. The questionnaire items mainly focus on the issues of environmental scanning, alignment of the vision, mission and values of the organization as well as identification of strategic goals and objectives.

The analysis is made using statistical values generated from SPSS computer software. The data collected through a Likert type questionnaire was analyzed using mean score and standard deviations. According to Best (1977) on a five-point Likert scale with responses ranging from 1 is strongly disagree, 2 is Disagree, 3 is Neutral, 4 is Agree and 5 is strongly agree. The mean score from [1-1.8] is lowest, from [1.81 -2.61] is low, from [2.62-3.41] is average/moderate, from [3.42-4.21] is good/high, and from [4.22-5] is considered very good/ very high. The details of the results are presented in the subsequent sections.

Table 2: Descriptive Statistics of Strategic Planning

Descriptive Statistics of Strategic Planning		
Questionnaire Items	**Mean**	**Std. Deviation**
Agreement on the strategic planning process between leaders, employees and stakeholders has been reached	3.4547	1.13856
Political, Economic, Social, technological, and Environmental (PESTEL) analysis is conducted	3.0564	1.16538
Internal (strength & weakness) and external (opportunity & threat) or (SWOT) analysis are conducted	3.0821	1.17775
Stakeholder analysis is conducted	2.7932	1.17768
Strategic Issues are identified in the strategic plan	3.0581	1.10263
The vision, mission and values of the organization are clearly articulated	2.9607	1.13483
The strategic goals and objectives of the organization are clear, measurable, realistic, and relevant	3.2650	1.14072
The strategic plan of the organization includes monitoring and evaluation system.	3.2222	1.10037
There is a continuous monitoring and evaluation of the strategic plan implementation	3.2957	1.16443
Timely feedback is given after monitoring is carried out to take corrective action	3.7077	1.07670
There is accountability mechanism in the strategic plan for accomplishments	3.4581	1.20588

Strategic management is the way to go for organizations to prepare themselves to sustain and overcome competition in marketplaces. It is important for all organizations in private sector, public sector and nonprofit organizations. It is a process that begins with self-assessment and realization and then reorganization to compete in a business environment. Strategic planning is an ongoing process by which an organization sets its forward course by bringing all its stakeholders together to examine current realities and define its vision for the future. It examines its strengths, weaknesses, and strengths, resources available, and opportunities (Hunger & Wheelen, 2004).

Strategic formulation is designed to help public and non-profit organizations (and communities) respond effectively to their new situations. It is u disciplined effort to produce fundamental decisions and actions shaping the nature and direction of an organization's (or other entity's) activities within legal bounds.' These decisions typically concern the organization's mandates, mission and product or service level and mix, cost, financing, management or organizational design. Strategic plans are a roadmap for how an organization wants to direct its resources to achieve a defined vision. The planning process for state and local governments documents what a community wants to be and how it intends to reach that goal. Strategic plans include vision and mission statements and details on communication and accountability (Rosenberg Hansen & Ferlie, 2016).

Based on the above theoretical foundations, the study tried to examine the current practice of strategic planning in the selected public sector organizations. Hence, table 2 above illustrates the results of strategic planning practices. As per the results, timely feedback is given after monitoring is carried out to take corrective action, availability of accountability mechanism in the strategic plan for accomplishments and reaching agreement on strategic planning process between leaders, employees and stakeholders are well practiced in the selected public sector organazations with mean values of 3.7077, 3.4581 and 3.4547 respectively. On the contrary, the majority of the public sector organisations failed to conduct stakeholder analysis and failed to clearly articulate the vision, mission and values of their organizations with mean values of 2.7932 and 2.9607.

According to Fraser & Stupak (2002), strategic planning may "encourage the clarification of business goals, systematic gathering of information, prioritization of projects, teamwork, environment responsiveness, communication of strategic to all stakeholders, and an improved performance." the authors are of the view that the strategic planning process may strategically position a business by striking balance between how it operates and the requirement of the environment. from the foregoing arguments, proponent of the strategic planning process sustains the view that strategic planning may not be regarded as panacea to business success, but it well managed, business is able to clarify future direction, establish priorities, effectively respond to the dynamic business environment and hence improve their performance.

Strategic Implementation

Strategic management is a forward-looking exercise, and all managers should be involved with it. If the strategic plan is available and well implemented, an organization will have little or no challenge in managing external changes. For businesses to survive, it should be able to operate successfully with environmental forces that are unstable and uncontrollable, and which can greatly affect decision-making process.

Organizations adapt to these environmental forces as they plan and carry out strategic activities. It is through strategic planning that an organization can predict changes in the environment and act proactively. If strategic plan is available and well implemented, an organization will have little or no challenge in managing external changes. Organizations manage the environment forces as they play and carry out strategic activities. It is through strategic planning that an organization can predict change in the environment and act pro-actively (Jayawarna & Dissanayake, 2019).

Table 3: Level of Strategy Implementation

Descriptive Statistics		
Questionnaire Items	**Mean**	**Std. Deviation**
The organization has annual plans to implement strategies	2.8667	1.10540
Management members and employees were participated in the development of strategic plan	2.7997	1.11250
When implementing strategies, the organization regularly reviews progress against targets.	2.8650	1.08881
The organization has specific procedures for implementing strategic plans	2.7179	1.18528
The organization frequently monitors progress versus targets while implementing plans	2.7607	1.11535
The organization adjusts its strategies during the implementation phase	2.6222	1.08343
There is clear accountability mechanism for failure to meet goals and objectives of the strategic plan implementation	2.9145	1.08518

Table 3 above shows the results regarding the levels of strategy implementation in the public sector. As indicated in the table above, there is a huge gap regarding the implementation of the designed strategic plan in the public sectors of Ethiopia. Almost most of the items measuring the level of strategic implementation in the public sector are low with mean values of below the average. Only, availability of accountability mechanism preparation of annual plans and review of progress against targets were found to be relatively higher in terms of their mean.

Regarding the above stated results, nobble (1999) argues that even good strategies may fail to give superior performance for the organization if not successfully implemented. According to Pride and Ferell (2003) strategy implementation is a process that turns implementation strategies and plans into actions to accomplish objectives. These address the questions of who, where, when, and how

to carry out successful strategic implementation. Managers and the employees should all be involved in implementation decision and good communication should be enhanced across all parties for effective strategy implementation (David, 2003). The implementation of a strategy depends on the ability of the managers to coordinate activities to transform strategic intent into action (Shah, 2005).

For the organization, strategy execution is more significant than strategy creation, since if the strategic plan is not effectively implemented by the staff and management, the costs and losses are higher than if the strategy is not properly formed. According to Pride and Ferell (2003), strategic implementation is the method of transforming strategies and plans into practice to accomplish wanted outcomes. These cover who, where, when, and how to implement a strategic plan effectively. Involvement of managers and staff in strategic planning implementation, decision-making and good communication improves the connection of all members (Alharthy, Rashid, Pagliari, & Khan, 2017).

Effective plan execution is widely considered as one of the most important factors and better organizational performance is the result of key stages of the strategy-making process. The effective execution of strategic choices is usually seen as crucial to achieving corporate goals and objectives. The strategy implementation plan is a crucial mobilizing tool for coordinating all implementation actions. The availability of necessary resources, employee involvement and engagement, vertical and horizontal partnerships to bridge gaps in technology, market, and organization internal capabilities are all part of the plan execution process, reconfiguration of the internal structure of the organization, leadership or championship in the implementation process, as well as top management commitment and support to the whole strategy process (Gachua & Orwa, 2015).

Factors Affecting Strategy Implementation

The study examined the factors affecting the effective implementation of strategic plan in the selected public sector organizations. Thus, the study identified four major factors that could impede the implementation of strategic plans. These factors are leadership support, organizational culture, organizational structure and communication. The details of the findings regarding descriptive and inferential statistics are presented below.

Table 4: Leadership Support

Descriptive Statistics		
Questionnaire Items	**Mean**	**Std. Deviation**
The organization's top management have the ability and insight to implement strategic plans	2.8701	1.10271
Leaders in the organization continuously motivate employees toward successful strategic plan implementation	2.9470	1.08173
The organization's top management has strong commitment to meeting timelines	2.8974	1.10869
The organization's top management has strong commitment to innovation, creativity and change	2.8615	1.10244
There is a strong commitment and continuous follow-up from the top management for implementation of strategic plan	2.8923	1.07924

Table 4 above portrays the result of descriptive statistics regarding the extent of leadership support for the effective implementation of the strategic plan. As per the results of the study, most of the respondents stated that, leadership support in their respective organisations is not adequate as indicated in the mean values.

However, past theoretical literature and empirical evidence have demonstrated that, strategy implementation involves leadership through coaching people to use their abilities and skills most effectively and efficiently to achieve organizational objectives. Without direction, people tend to do their work accordingly to their personal view of what tasks should be done, how, and in what order. Effective strategic leadership is the foundation for successfully using the strategic management process. Strategic leaders guide the firm in ways that result in forming a vision and mission. Often, this guidance involves leaders creating goals that stretch everyone in the organization as a foundation for enhancing firm performance. A positive outcome of stretch goals is their ability to provoke breakthrough thinking, which often leads to innovation.

Table 5: Organizational Culture

Descriptive Statistics

Questionnaire Items	Mean	Std. Deviation
The values set by the organization are appropriate and aligned to the vision, mission and strategic initiatives.	2.8615	1.09465
The organization culture is aligned with the vision, values and strategy	2.7385	1.10027
The organization believes in loyalty and mutual trust, teamwork, consensus, and participation	2.5060	1.14245
The organization's culture allows for the acceptance of new ideas.	2.3487	1.18123

Organizational culture is generally understood as all a company's beliefs, values and attitudes, and how these influences the behaviour of its employees. Culture affects how people experience an organization—that is, what it's like for a customer to buy from a company or a supplier to work with it.

There is a strong link between corporate culture and strategic management. A company is managed, and strategic decisions are made using the same values, beliefs and principles set through the organizational culture. Strategy sets the direction and focus, elaborates plans and formal environment for employees to understand the organization's goals, and while culture helps accomplishing goals by encompassing them in the organization's shared values and beliefs. The vision of the organization needs to be first assimilated in the culture.

A strategy can only be implemented it is backed by the corporate culture. The company sets the headline of its story through the strategy and the language through culture. Intention is given by strategy, and culture sets and measures the aspiration, the commitment, the performance. Corporate culture will impact the way a leader expresses his vision to other members of the organization as well as gaining support for implementing new strategies. Strategy gives the direction, and culture sets the way you make your trip until destination positive, negative, challenging, funny, and painful.

Table 5 above depicts the results regarding the relationship between organizational culture and effective implementation of strategic plans. As indicated in the table, most of the items measuring the dimension of organizational culture are average and below average. However, organizational culture is the most important determining factor for the successful implementation of strategy plans.

This is because; organizational culture is a set of ideologies, symbols, and core values that influences how the firm conducts its business and helps regulate and control employees' behavior, it can be a source of competitive advantage. Given that each firm's culture is unique, it

is possible that a vibrant organizational culture is an increasingly important source of differentiation for firms to emphasize when pursuing strategic competitiveness and above-average returns. Organizational culture can strongly affect the ability of a company to shift its strategic direction because it has a powerful influence on the behavior of all employees.

Table 6: Organizational Structure

Descriptive Statistics

Questionnaire Items	Mean	Std. Deviation
The organization's present organizational structure is aligned with the strategy	2.7726	1.39517
The organization's organizational structure adapts flexibly to strategic plans	2.9368	1.37906
The organizational structure of the organization allows horizontal communication, and team working	2.8308	1.23743
The organizational structure is appropriate for effective decision making	3.5026	1.11669
The organizational structure adequately supports strategy implementation at the organization	3.4667	1.07875

Table 6 shows the results regarding the relationship between organizational structure and strategy implementation. As per the results portrayed in the table, there is above average relationship between the true variables. Prior theoretical and empirical evidence also demonstrated this position.

Organizational structure specifies the organizational formal reporting relationships, procedures, authority, and decision-making processes. Thus, an organizational structure determines and specifies the decisions that are to be made and the work that is to be completed by everyone within an organization as a result of those decisions (Poister, 2010). Organizational structure helps firms successfully implement their strategies as a means of outperforming competitors. Thus, after firms formulate their strategies, executives must make designing organizational structure its next priority. Strategy, structure and the environment need to be closely aligned. Otherwise, organizational performance will suffer (Ketema, 2015). Organizational structure can facilitate strategy implementation efforts, but changes in this structure should not be expected to make a bad strategy good, to make bad management good, or to make bad products sell.

Table 7: Communication

Descriptive Statistics

Questionnaire Items	Mean	Std. Deviation
There is frequent and timely communication among the ministry offices and staffs.	3.3436	1.05819
Information systems used to monitor strategy implementation is adequate in the organization.	3.2838	2.02759
There is a good horizontal communication among the offices and staffs in the organization.	3.0923	1.15940
There is two-way (top down and bottom up) communication in the organization regarding strategy plan and implementation	2.7757	1.17552

For a successful implementation of a strategy, employees must understand and buy in the organizational strategy, as well as their role (Kisho, 2022). To this end employee communication will have a vital importance to align employees to the business strategy. Employees need to have a clear vision of what they do and how it helps to achieve strategic goals and objectives of the organization. Studies show that most organizations fail to turn the strategies into actions despite having a well formulated strategy. Several factors can potentially affect the process by which strategic plans are turned into implementable actions. According to Kraaijenbrink (2015), poor communication expressed in terms of vagueness, lack or absence of communication is among the

top strategy implementation problems that lead to poor execution. In view of Muller (2004), communication affects strategy implementation directly through its effect on the individuals involved in implementation, the resources required, the infrastructural orientation of the organization and the process of monitoring and evaluation among other key components.

Inferential Statistics

To determine the factor that significantly affects strategy implementation, inferential statistics was performed. Thus, first correlation was carried out to examine the relationship between the variables.

Correlation Analysis

Table 8: Results of Correlation Analysis

Correlations

		Leadership	Culture	Structure	Communication	Implementation
Leadership	Pearson Correlation	1				
	Sig. (2-tailed)					
Culture	Pearson Correlation	.600**	1			
	Sig. (2-tailed)	.000				
Structure	Pearson Correlation	.505**	.476**	1		
	Sig. (2-tailed)	.000	.000			
Communication	Pearson Correlation	.473**	.495**	.502**	1	
	Sig. (2-tailed)	.000	.000	.000		
Implementation	Pearson Correlation	.722**	.692**	.453**	.562**	1
	Sig. (2-tailed)	.000	.000	.000	.000	

**. Correlation is significant at the 0.01 level (2-tailed).

To calculating the degree of relationship between two or more variables, correlation analysis examines the joint variation of those variables. The product moment correlation coefficient was utilized to determine the relationship between the study's independent and dependent variables as well as to assess the strength of this relationship. This coefficient assumes that the two variables have a linear relationship, that they are casually related, which means that one of the variables is independent and the other is dependent, and that both variables are subject to a significant number of independent causes that combine to produce a normal distribution.Accordingly, correlation analysis was performed in order to identify the relationship between the research variables. Table 8 above shows the result of correlation analysis. As indicated in the table, leadership and culture have a strong and positive relationship with strategy implementation with the value of *(r = .722**) and (r = .692**)* respectively. Communication and structure have a moderate and positive relationship with strategy implementation.

Regression Analysis

Table 9: Model Summary of the Regression Analysis

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.807[a]	.652	.650	.51961

a. Predictors: (Constant), Communication, Leadership, Structure, Culture

The R column represents the value of *R*, the multiple correlation coefficients. R can be one measure of the quality of the prediction of the dependent Variable (strategic plan implementation). A value of **.807** indicated that a good level of prediction.

Adjusted R Square was the coefficient of determination and measures the proportion of variance in dependent variable (strategic plan implementation) that is explained by independent variables. This implied that 65% of variance.

That was 65% of variations or changes in strategic plan implementation was caused by the four identified factors namely, leadership support, organizational culture, organizational structure and communication systems in the selected public sector institutions. The rest 35% of the variation is caused by factors other than the predictors included in this model.

Table 10: Results of ANOVA

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	293.392	4	73.348	271.661	.000[b]
	Residual	156.599	580	.270		
	Total	449.991	584			

a. Dependent Variable: Strategy Implementation

b. Predictors: (Constant), Communication, Leadership, Structure, Culture

ANOVA tests the null hypothesis that multiple 'R' in the population equals 0. As shown in the table, the model reaches statistical significance (Sig. = .000). Hence, the table demonstrates that the independent factors statistically significantly predict the dependent variable; the regression model is a good fit of the data here.

The F-ratio illustrated in table 10 above in the ANOVA result indicates the overall regression model fits the data well. The table demonstrates that the independent factors statistically significantly predict the dependent variable; the regression model is a good fit of the data here.

Table 11: Results of Regression Analysis

Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.289	.095		3.051	.002
	Leadership	.424	.032	.436	13.338	.000
	Culture	.318	.030	.346	10.647	.000
	Structure	-.036	.034	-.032	-1.050	.294
	Communication	.178	.027	.200	6.572	.000

a. Dependent Variable: Strategy Implementation

Multiple regression analysis was performed to examine the effect of each independent variable on the dependent variable as shown in Table 11 above. Accordingly, the unstandardized coefficient (B) indicates how much the dependent variable varies with the independent variable when all other independent variables are held constant. From Table 4.13 the constant, B_0 had a value of .289 meaning when all other independent variables are held at zero the rate of strategic plan implementation will be .289. The independent variables coefficients B_1, B_2, and B_4 representing leadership support, organizational culture and communication gave statistically significant results with *P* values less than 0.05 at 5% of significant level. Whereas B_3 representing organizational structure did not gave statistically significant results with *P* -value = .294 which was greater than 0.05 at 5% of significant level.

Conclusions and Recommendations

The purpose of this study was to examine strategic planning practices and its accountability mechanisms in the Ethiopian public sector institutions. Consequently, to conduct the study appropriate research method, sampling techniques and instruments were used. Accordingly, descriptive and explanatory research designs with a concurrent mixed research approach were employed in this study.

After the analysis and interpretation of the data, the following points were taken as the main findings of the study.

- *Availability of timely feedback regarding the progress of performance against the predetermined standards.*
- *Installation of accountability systems to hold failure to meet or achieve the desired results. However, the system is not clear, and the measurements are not explicitly stated as it was confirmed from the interview and open-ended questionnaires.*
- *Failure to clearly articulate the vision, mission and values of the organization. Additionally, failure to conduct stakeholder analysis during the preparation of the strategic plan of their organization.*
- *Lack of effective implementation of the strategic plan.*

The issue of quality strategic management is becoming a global concern that demands continuous reform to fit the turbulent environment and changing needs of people. This study examined

strategic planning practices and accountability for accomplishments in the Ethiopian public sector organizations.

To do so, both the primary and the secondary data were gathered by using structured questionnaire, key informant interviews and written documents. Respondents were selected by using simple random sampling techniques and structured questionnaires and interview guides were prepared to gather data from employees and key informants respectively. Both qualitative and quantitative descriptions were applied on the data gathered to analyze the information obtained. By undertaking a detailed analysis of the situation, the following are the major conclusions drawn.

From the summary of findings, availability of accountability mechanisms, providing feedback and creating agreement between leaders and employees is promising and in a good status. Additionally, it can be also concluded that environmental scanning activities of the public sectors are commendable enough though there are some grey areas that need improvement. The organizations comprehensively assessed both the external and internal environment though it failed to involve some stakeholders. Moreover, employees of the organisations didn't participate in the planning process.

However, there is still a huge gap in terms of implementing the strategy in the corporation. The results of the study confirmed that, there is lack of participation of relevant stakeholders, the goals and objectives are ambiguous to implement, there is no continuous monitoring and evaluation systems. All these factors have contributed to the unsuccessful implementation of the strategic plan of the public sector organizations.

Based on the findings of the study, the following major recommendations are forwarded

- ✓ *The top management should make sure resources required for implementation of strategic plans such as human, finance and facilities are available as planned to avoid failure of implementation process. Continuous training and review also need to be emphasized to meet the changing need and demand availed by internal and external environment.*
- ✓ *Successful strategy implementation is a key for any organization's survival. Many organizations could not sustain their competitive advantages, despite having a robust strategy formulation process, because they lack the processes in implementing the strategies. Considering the higher failure rates in implementation of strategies, more attention should be given by executives to implementing the strategy.*
- ✓ *Articulation of vision and mission statements clearly needs to be given much emphasis by the public sectors. In addition, involvement and participation of stakeholders is important to identify the needs of the community. So, public sector organizations need to work aggressively in this area.*
- ✓ *Should apply two-way communication practices from top to down and down to top. It enables employees to question, criticize, and provide feedback on the organization's plan execution. In terms of organizational structure, it would be preferable if top management, in collaboration with the relevant parties, revise the organization structure by decreasing the hierarchy and making it more favorable to decision-making.*
- ✓ *Coordination of resources and management commitment should always be embraced for successful implementation. Also, the management should continue supporting employees in term of expertise, financial resources, and other resources which will add value in their efforts of executing strategies. Also, top management should facilitate continuous monitoring and evaluation of strategic plan implementation to determine the success and area that needs improvement.*

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3.2. 3Counterproductive Work Behavior as an Outcome of Societal Culture and Personality Traits among Public Sector Employees in North Wollo Zone, Northeastern Ethiopia

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Abstract

Counterproductive work behavior (CWB) is a major global issue that adversely affects both organizations and their employees. This problem is more prevalent in developing countries and public sector organizations than private ones. To address this issue, this study examined the role of personality traits and societal cultural values in predicting CWB among public sector employees. A survey was conducted on 422 government employees from various sectors, measuring CWBs, the big five personality traits, and cultural dimensions. The study found that extraversion, neuroticism, agreeableness, and openness, along with assertiveness and institutional collectivism, significantly predicted CWB-I and CWB-O, accounting for approximately 29.1% of the overall variance in counterproductive work behavior. The study also revealed that cultural dimensions such as future orientation, performance orientation, and assertiveness influenced both CWB-I and CWB-O. However, uncertainty avoidance, institutional collectivism, and power distance did not significantly correlate with workplace deviant behaviors. The study emphasizes the importance of considering situational and personal factors, such as cultural and personality traits, to understand the nature of workplace deviant behavior among public sector employees. The study suggests community-based interventions and reward policies that motivate employees based on performance for better productivity. However, the study has certain limitations, and future research should employ more advanced methodologies to address these limitations.

Keywords: Counterproductive work behavior, personality traits, societal cultural values, workplace deviance, Northeastern Ethiopia

Introduction

Counterproductive work behavior (CWB) refers to various negative behaviors exhibited by employees that can harm organizations, clients, co-workers, and supervisors. These behaviors can be deviant, dysfunctional, retaliatory, aggressive, or misbehaviors and thereby more recently, studies showed that more than 90% of employees admit to participating in some type of workplace deviance (Bennett et al., 2018).

The dimensionality of CWB is a topic of ongoing debate among researchers and experts. Spector et al.(2006) proposed five dimensions: abuse, sabotage, theft, production deviance, and withdrawal. However, Bennett & Robinson (2000) identified two dimensions: CWB directed toward the organization (CWB-O) and CWB directed toward people (CWB-P), which have received empirical and conceptual support and are considered the most relevant for analysis. Moreover, CWB-I entails behaviors aimed at harming others in the workplace, such as spreading rumors about their colleagues. CWB-O encompasses behaviors that seek damage at the organizational level, such as stealing company property (Robinson & Bennett, 2000).

In recent years, there has been a significant increase in research focusing on counterproductive work behavior (CWB) due to its widespread and costly consequences for organizations and their stakeholders (Cohen, 2016). As a result, CWB has emerged as a significant concern among researchers, managers, and the general public, as it poses a significant threat to organizations worldwide (Makhdoom et al., 2019). As a result, organizations suffer substantial financial losses each year due to behaviors such as theft and absenteeism directed toward the organization (DeShong et al., 2015). While counterproductive work behavior (CWB) is prevalent worldwide and has detrimental outcomes for organizations and their employees, it is particularly becoming a widespread problem in organizations within developing countries (Makhdoom et al., 2019; Zelalem et al., 2019).

Moreover, research indicates that CWB is more pervasive and common in public sector organizations compared to private ones (Hasanati & Karina, 2018).

Although many studies have examined counterproductive work behavior (CWB) and its predictors, our understanding of the topic still needs to be completed. Researchers have focused on identifying individual and situational factors that can predict CWB, resulting in worldwide meta-analyses and empirical studies (Cohen, 2016). For instance, meta-analysis studies on employees' personality traits can predict counterproductive workplace behavior (Salgado, 2002; Berry et al., 2007).

Furthermore, empirical studies by Clark (2013), Salgado et al. (2015), Ferreira et al. (2016) have specifically examined the association between the Big Five personality traits and CWBs. However, the results of these studies have been inconclusive, highlighting the complexity of the relationship between personality and CWBs. In this regard, several studies have examined the relationship between the Big Five personality traits and counterproductive work behaviors (CWBs), but the findings have been mixed and contradictory. For example, Berry et al. (2007) conducted a meta-analysis and found that conscientiousness, agreeableness, and neuroticism were negatively correlated with CWBs, while extraversion and openness showed low correlations.

Similarly, empirical studies by Clark (2013) and Ferreira et al. (2016) also found negative correlations between agreeableness, neuroticism, conscientiousness, and CWBs in different contexts.

However, there have been contradictory findings as well. For instance, Muhammad Hafidz (2012) found negative correlations between agreeableness and conscientiousness with CWBs in Malaysia, while Ismail et al. (2018) reported a positive correlation between conscientiousness and CWBs in Malaysia. Kozako et al. (2013) found a positive relationship between neuroticism and CWBs, contradicting Mount, et al. (2006), who found no relationship between neuroticism and CWBs. Özbağ (2019) study in Turkey indicated that emotional stability, conscientiousness, and agreeableness were significant predictors for both dimensions of CWBs.

Research on the relationship between personality traits and CWBs has produced inconsistent and contradictory findings that highlight the complexity of this relationship and the need for further research to gain a better understanding.

As far as contextual variables are concerned, it has been revealed that various contextual factors can influence or predict the CWB and its dimensions that target interpersonal and organizational deviances (Hsi, 2017). These variables include organizational justice and interpersonal conflict (Berry et al., 2007; Hasanati & Karina (2018), transformational leadership (Kessler et al., 2013). However, only a few studies focused on societal cultural dimensions as a predictor of CWB. Past researchers have argued that cultural values influence employees' propensity to engage in CWBs (Taylor 2012; Smithikrai, 2014; Boachie, 2021) in general and cultural motivators and control

variables in particular (Marcus & Schuler, 2004; Taylor, 2012). Put differently, most previous studies have primarily focused on individualism-collectivism and power distance dimensions when measuring CWB. However, these dimensions alone may not be sufficient to capture all aspects of CWB (Taras et al., 2010).

For example, Smithikrai (2014) found that collectivism has a negative relationship with CWB and predicted employee behavior, while individualism was positively related to and predicted CWBs. Boachie (2021) showed that it was hypothesized that collectivism would be inversely related to both components of CWB while Individualism would be positively related to both CWB components. In addition, the study was limited to collectivism-individualism culture, ignoring other cultural values, which may predict CWBs.

While numerous studies have identified various individual and situational factors that contribute to counterproductive work behaviors (CWBs), only a few have attempted to evaluate the combined influence of personality traits and culture as predictors of CWBs and their dimensions (Holtz & Harold, 2013).

The aim of this study is to examine the correlation between personality traits, cultural dimensions, and counterproductive work behavior (CWB) based on the GLOBE (Global Leadership and Organizational Behavior Effectiveness Research Program) model developed by House et al. (2004).

Methodology

Research Design

The study employed a causal research design and utilized a quantitative approach, which is frequently used to establish cause and effect relationships between the variables under investigation. The main goal of the study was to examine the relationships between personality traits, societal cultural values and practices, and counterproductive work behavior. Therefore, a quantitative approach was considered the most suitable method for this purpose.

Participants

The study participants[1] were 422 full-time employees working in various public sectors in the capital town of North Wollo Zone, Northeastern Ethiopia, who were selected using convenience sampling. In this study, 72.3 % and 27.7 % were males and females respectively.

The participants reported they were from public sectors of different sample sizes (social service sectors=31.5%, economic sectors=26.1%, administrative sectors=24.9%, and peace and security sectors=17.5%). Hence, all participants eligible to participate in this study completed the questionnaire during the regular working hours. Oral informed consent was obtained from all participants, and all participation is anonymous and voluntary.

Measures

Personality traits: The study utilized the short version of the International Personality Item Pool (IPIP) five-factor model personality scale developed by Donnellan et al. (2006). This shortened version consists of 20 items, a condensed form of the original 50-item IPIP-FFM. The Big Five Personality Traits, namely agreeableness, conscientiousness, emotional stability, extraversion, and openness, were measured using this scale. The internal consistency of the measurements for each

[1] The sample size was calculated using single proportion formula (n = (Zα/2)2 P (1-P)/d2, n= (1.96)2*0.5*0.5/ (0.05)2=384) and 10% non-response rate yields 422 total sample size

trait was as follows: agreeableness (.75), conscientiousness (.75), emotional stability (.70), extraversion (.82), and openness (.70).

***Cultural Dimensions*:** The GLOBE team developed scales for nine cultural dimensions: uncertainty avoidance, power distance, institutional collectivism, in-group collectivism, gender egalitarianism, assertiveness, future orientation, performance orientation, and humane orientation. Understanding the broader cultural paradigm of a society is crucial for researchers to comprehend its impact on organizational operations (Vukonjanski, Nikolić, Hadžić, Terek, & Nedeljković, 2012). This study investigates how GLOBE's societal cultural values and practices influence counterproductive work behaviors (CWB) and its dimensions (CWB-O and CWB-I). As a result, the measurement instrument is based on Beta questionnaire of GLOBE project.

The scales utilized in this study comprise 49 items (24 for cultural practices and 25 for cultural values of the society) and associated to six cultural dimensions as follows: uncertainty avoidance (9 items), institutional collectivism (8 items), performance orientation (7 items), future orientation (9 items), assertiveness (6 items), and power distance (10 items) and are rated on a seven-point Likert scale. However, the authors used a five-point scale to ensure respondent comfort.

Spector et al. (2006) developed a short version of the CWB-C (Counterproductive Work Behavior Checklist) to measure organizational behaviors (CWB-O) and interpersonal deviant workplace behaviors (CWB-I).

This measure has been widely used in empirical studies on CWBs due to its versatility and ability to assess two subscales of CWBs within an organization in addition to five dimensions. The checklist consists of a 23-item questionnaire, and participants were asked to indicate the frequency of engaging in specific behaviors using a five-point Likert-type scale, ranging from one (never) to five (every day). Self-reported questions were administered to capture the frequency of workplace deviant behaviors, as self-report questions tend to capture a broader spectrum of CWBs compared to observations by others, particularly supervisors (Berry et al., 2010). The authors reported reliability of $\alpha = .86$ for CWB-I and $\alpha = .86$ for CWB-O.

Statistical Analysis

The data collected from the questionnaire was coded and entered SPSS version 26. Inferential statistics, specifically the Pearson Moment correlation coefficient, were utilized to examine the relationships between independent and dependent variables. A stepwise multiple regression analysis was conducted to identify the best model with the strongest predictors of Big Five personality traits and cultural dimensions on overall counterproductive work behaviors (CWBs) and its dimensions (CWB-O and CWB-I).

Results and Discussions

Pearson Moment Correlation Coefficient Results

Table 1 presents the Pearson Moment Correlation Coefficient results between the big five personality factors and dimensions of counterproductive work behaviors (CWB-I and CWB-O). Accordingly, personality traits of extraversion and agreeableness had weak negative associations with CWB-I ($r=-0.236$, $r=-0.202$ at $P<0.05$) and CWB-O ($r=0.247$, $r=-0.25$ at $p<0.05$), respectively. However, neuroticism and openness to experience had a weak positive correlation with CWB-I ($r=0.116$, $r=0.22$) and CWB-O ($r= 0.184$, $r= 0.203$ at $P<0.05$). Conscientiousness had a very weak positive association with CWB-I ($r=0.03$, $p<0.05$) but a very weak negative correlation with CWB-O ($r= -0.0065$).

Table 1: Correlation of Big Five Personality Traits and dimensions of CWB

Column	E	N	O	A	C	CWB-I	CWB-O
E	1						
N	0.316	1					
O	-0.041	0.192	1				
A	0.348	0.287	-0.091	1			
C	0.163	0.071	0.241	0.367	1		
CWB-I	-0.236	0.116	0.226	-0.202	0.031	1	
CWB-0	-0.247	0.184	0.203	-0.253	-0.007	0.877	1

(E=extraversion, N=neuroticism, O=openness to experience, A=agreeableness, C= Conscientiousness

Table 2 presents the Pearson Moment Correlation coefficient results between cultural dimensions and counterproductive work behavior (CWB-I and CWB-O). Cultural dimensions of uncertainty avoidance had no significant correlation with CWB-I (r=-0.031, p>0.05) and CWB-O (r=0.013, p>0.05), respectively. Similarly, institutional collectivism and power distance were not significantly correlated with CWB-I (r=-0.056, P>0.05) and r=-0.031, p>0.05), respectively. On the other hand, future orientation and assertiveness were statistically significant with CWB-I (r=-0.193, p<0.01) and r=-0.178, p<0.01), respectively. Similarly, these cultural dimensions were also statistically significant correlations with CWB-O (r=-0.219, p<0.01 and r=-0.285, p<0.01), respectively. Moreover, institutional collectivism, future orientation, and power distance had a very weak negative association with CWB-I and CWB-O. In contrast, performance orientation and assertiveness had a very weak negative association with CWB-I (r= -0.193 and -0.178 at P<0.01) and a very weak negative association with CWB-O (r=-0.219 and r=-0.285at p<0.01) respectively. Uncertainty avoidance, however, a very weak positive association with CWB-O.

Table 2: Correlation of Cultural Dimensions and Counterproductive Work Behaviors

UA	**IC**	**PO**	**FO**	**As**	**PD**	**CWB-I**	**CWB-O**	
UA	1							
IC	.073	1						
PO	.078	.347**	1					
FO	.073	.448**	.605**	1				
As	-.014	.425**	.304**	.309**	1			
PD	.132**	.188**	.452**	.442**	.416**	1		
CWB-I	-.031	-.056	-.126**	-.193**	-.178**	-.031	1	
CWB-O	.013	-.099*	-.165**	-.219**	-.285**	-.140**	.877**	1

Note. (UA)= uncertainty avoidance, (IC) = institutional collectivism, (PO) = performance orientation, (FO) = future orientation, (AS) = assertiveness, (PD) = Power distance; * = $p < .05$, ** = $p < .01$.

Table 3 depicts the Pearson moment correlation coefficient results between cultural control and motivator variables with CWB-I and CWB-O. Accordingly, there was a very weak negative association between the cultural control variable and CWB-I (r=-0.146) and CWB-O (r=-0.166 at P<0.01), respectively. A very weak negative association was observed between cultural motivator variables and CWB-I (r= -0.137, p<0.01), while a weak negative association with CWB-O (r= -0.264, p<0.01).

Table 3: Correlation of cultural controls and motivators and Counterproductive work behavior (CWB-I and CWB-O)

		Cultural controls	Cultural Motivators	CWB-I	CWB-O
cultural controls		1	.470**	-.146**	-.166**
Cultural Motivators		.470**	1	-.137**	-.264**

****. Correlation is significant at the 0.01 level (2-tailed).**

Multiple Linear Regression Analysis

The multiple regression analysis was performed through the linear regression analysis method to examine the role of personality traits and cultural dimensions on public sector employees' overall counterproductive work behavior. First, stepwise multiple regression analysis was performed to determine the best model with the highest influence/ predictor on the CWB. Accordingly, BFTs (big five personality traits) and cultural dimensions were examined against the CWB. Table 4 shows a stepwise multiple regression analysis of the big five personality traits and cultural dimensions on CWB. The big five personality traits of employees (agreeableness, conscientiousness, neuroticism, openness, and extraversion), and cultural dimensions were examined to understand their prediction of counterproductive work behavior. The R square value of the predictor variables in model 7 was 0.291. It implies that the big five personality traits (extraversion, neuroticism, agreeableness, openness) and cultural dimensions (Assertiveness and institutional collectivism) were explained by about 29.1% variance of the outcome or overall counterproductive work behavior. Therefore, model 7 is the best model that fits the given data

Table 4: Model summary of the big five factors and cultural dimensions and overall CWB

Model Summary [h]

Model	R	R^2	Adjusted R^2	Change Statistics				
				R^2 Change	t	df1	df2	Sig
1	.255[a]	.065	.063	.065	28.961	1	415	.000
2	.400[b]	.160	.156	.095	46.723	1	414	.000
3	.459[c]	.211	.205	.051	26.526	1	413	.000
4	.492[d]	.243	.235	.032	17.308	1	412	.000
5	.519[e]	.269	.260	.027	15.056	1	411	.000
6	.533[f]	.284	.274	12.94999	.015		8.654	.003
7	.540[g]	.291	.279	12.90332	.007		3.971	.047

a. Predictors: (Constant), Assertiveness, b. Predictors: (Constant), assertiveness, openness, c. Predictors: (Constant), Assertiveness, openness, extraversion, d. Predictors: (Constant), Assertiveness, openness, extraversion, Neuroticism, e. Predictors: (Constant), Assertiveness, openness, extraversion, Neuroticism, Agreeableness, f. Predictors: (Constant), Assertiveness, openness, extraversion, Neuroticism, agreeableness, Conscientiousness, g. Predictors: (Constant), Assertiveness, openness, extraversion, Neuroticism, agreeableness, Conscientiousness, Institutional Collectivism, h. Dependent Variable: Overall Counterproductive work behavior of respondents

Moreover, in the regression coefficient values, the beta value (β) shows the strength of the study's independent variables on the outcome variable (CWB). The coefficient results were explained in the stepwise regression analysis. Out of 11 independent variables for stepwise regression analysis, only seven independent variables were performed for the final regression model (see Table 5). In the first stage/model 1, assertiveness was the predictor of CWB (β=-.255, t=-5.38, p=.000).

Model 2 showed that openness to experience (β=.324, t=6.8, p=.000) was added to assertiveness (β=-.356, t=-7.5, p=.000) as a predictor of CWB. In model 3, extraversion (β=-.226, t=-5.2, p=.000) is a predictor in addition to assertiveness and extraversion in the model 2. In the fourth stage, neuroticism (β=.196, t=4.16, p=.000); in the fifth stage, agreeableness (β=-.18, t=-3.88, p=.000);

in the sixth stage conscientiousness (β=.14, t=2.94, p=.003) and the final stage institutional collectivism (β=0.103, t=2, p=.047) was added to the seventh model as the predictor of CWB. In the final model, assertiveness (β =-.350, t=-7.084, p=.000) negatively predicted the CWB. It shows that employees with low/negative assertiveness are more likely to engage in counterproductive work behav

Table 5: Regression beta (β) Coefficient results of the big five factor and Cultural dimensions and CWB

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	S. E	Beta		
1	(Constant)	54.429	2.748	-.255	19.810	.000
	Assertiveness	-.593	.110		-5.382	.000
2	(Constant)	41.620	3.211	-.356	12.961	.000
	Assertiveness	-.827	.110	.324	-7.512	.000
	Openness	1.142	.167		6.835	.000
3	(Constant)	53.330	3.858	-.342	13.824	.000
	Assertiveness	-.795	.107	.309	-7.431	.000
	Openness	1.091	.162	-.226	6.714	.000
	Extraversion	-.691	.134		-5.150	.000
4	(Constant)	42.779	4.555	-.313	9.391	.000
	Assertiveness	-.728	.106	.259	-6.849	.000
	Openness	.912	.165	-.293	5.526	.000
	Extraversion	-.898	.141	.196	-6.384	.000
	Neuroticism	.986	.237		4.160	.000
5	(Constant)	49.025	4.760	-.293	10.299	.000
	Assertiveness	-.682	.105	.231	-6.485	.000
	Openness	.814	.164	-.245	4.954	.000
	Extraversion	-.751	.143	.238	-5.231	.000
	Neuroticism	1.196	.239	-.181	5.002	.000
	Agreeableness	-.977	.252		-3.880	.000
6	(Constant)	42.252	5.248	-.309	8.051	.000
	Assertiveness	-.719	.105	.194	-6.850	.000
	Openness	.684	.169	-.253	4.055	.000
	Extraversion	-.774	.142	.252	-5.437	.000
	Neuroticism	1.265	.238	-.236	5.311	.000
	Agreeableness	-1.275	.269	.140	-4.736	.000
	Conscientiousness	.715	.269		2.942	.003
7	(Constant)	40.634	5.292	-.350	7.679	.000
	Assertiveness	-.813	.115	.186	-7.084	.000
	Openness	.656	.169	-.291	3.889	.000
	Extraversion	-.892	.154	.241	-5.803	.000
	Neuroticism	1.213	.239	-.232	5.083	.000
	Agreeableness	-1.253	.242	.141	-4.666	.000
	Conscientiousness	.717	.175	.103	2.961	.003
	Institutional Collectivism	.349			1.993	.047

a. Dependent Variable: Overall Counterproductive work behavior of respondents

Discussions

Big Five Personality Traits and Dimensions of CWBs

The study discovered that the Big Five personality traits generally have weak positive connections with both CWB-I and CWB-O, except for extraversion and agreeableness, which show different

patterns. Conscientiousness and openness exhibit beneficial associations, reducing employees' engagement in workplace deviance, thus safeguarding organizational productivity. This contradicts with Berry et al. (2007) meta-analysis and Ismail et al. (2018), indicating that conscientiousness and emotional stability are negatively correlated with dimensions of CWBs but the present study align with Berry et al. (2007) and Hafidz (2012) as agreeableness was negatively associated with both dimensions of CWB but contradicts with Salgado (2002) found agreeableness to be a significant predictor of counterproductive work behavior. Neuroticism displays a weak positive correlation with CWB, potentially leading to detrimental outcomes in both organizational and personal contexts, as also observed by Salgado (2002) and Kozako et al. (2013). This suggests that individuals high in neuroticism may be more prone to engaging in undesirable workplace behaviors.

Cultural Dimensions and CWBs

The study found no significant relationship between uncertainty avoidance, institutional collectivism, and power distance with organizational and personal deviance. However, it did reveal a significant association between future orientation, performance orientation, assertiveness, and CWBs. Specifically, there was a weak negative correlation between performance orientation, future orientation, and assertiveness with both CWB-I and CWB-O. This suggests that individuals in societies with low levels of these traits may be more inclined to engage in counterproductive behaviors. These findings align with Taylor's (2012) meta-analysis, which also indicated a negative association between cultural controls and assertiveness with organizational and interpersonal deviance.

Regression result of big five personality traits, cultural dimensions, and CWBs

Stepwise multiple linear regression analysis was used to examine each independent variable's prediction level and identify the stronger predictors. The big five personality traits (extraversion, neuroticism, agreeableness, openness) and cultural dimensions (Assertiveness and institutional collectivism) were statistically significant and the strongest predictors of both CWB-I and CWB-O. Accordingly, the R square value of the predictor variables in the best model was explained about a 29.1% variance of the outcome or overall counterproductive work behavior. Regarding the big five personality traits, the present study found that extraversion, neuroticism, agreeableness, and openness were the best predictors of CWB towards organization and interpersonal employees. However, the present study disagrees with Salgado's (2002) findings that conscientiousness strongly predicts behaviors harmful to the organization and other employees. Moreover, the present study disagrees with a study conducted in Brazil by Ferreira et al. (2016), whose findings showed that all five personality traits contributed to predictors of CWB dimensions.

In addition, the present study showed that extraversion and agreeableness negatively predicted the CWB. In contrast, neuroticism positively predicted CWB, where employees with higher neuroticism are more likely to engage in counterproductive work behavior. The result is inconsistent with the works of Hsi (2017) conducted in California State, USA, whose finding showed that agreeableness and conscientiousness predicted CWB directed at the organization; nevertheless, agreeableness, conscientiousness, and neuroticism were significantly related to CWB-I, but agreeableness, conscientiousness were negatively related to CWB-O.

On the other hand, assertiveness, a cultural dimension variable, was negatively predicted by the CWB. It shows that employees with low/negative assertiveness are more likely to engage in counterproductive work behavior.

Conclusion and Recommendations

The study examined how the Big Five personality traits and cultural dimensions influence counterproductive work behavior (CWB) toward organizations and interpersonal relations. It found that extraversion and agreeableness are negatively correlated with CWB, while neuroticism shows a positive association. Future and performance orientation, as well as assertiveness, are also linked to CWB. The regression analysis confirms that these factors strongly predict both CWB-I and CWB-O. The study underscores the importance of considering both individual traits and cultural influences in understanding workplace deviance. As a result, the study suggests community-based interventions (i.e. fostering a sense of community among employees) and reward policies that motivate employees based on performance for better productivity.

However, its generalizability may be limited due to a one-time data collection method relying on self-reporting. The present study employed GLOBE's societal cultural values and practices using self-reported questions. Future research should employ longitudinal designs and organizational culture values and practices using peer-reported measures for a more comprehensive understanding.

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3.3. A Study of Public Servants' Character Strengths for Enhancing Work Performance

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Abstract

This study sought to examine the correlation between six-character strengths virtues and work performance. Quantitative analysis revealed that employees exhibit commendable scores across all six virtues: however, their failure to effectively utilize these strengths in the workplace results in lower performance ratings. This lack of utilization may stem from employees' unawareness of how to leverage their strengths to achieve optimal performance outcomes. Qualitative findings indicate a potential deficit in employees' training regarding mindset cultivation and strengths utilization, thereby hindering their ability to capitalize on their character strengths for enhanced job performance. Over time, this discrepancy between possessing strengths conducive to success and underperforming in the workplace can lead to decreased motivation and even burnout among employees. To address this issue and improve performance, it is essential for employees to recognize their strengths and utilize them strategically. Consequently, organizations are encouraged to implement workshops or coaching sessions focused on developing strengths, thereby fostering a more motivated and engaged workforce, resulting in improved job performance.

Keywords: *Character strengths and work performance correlation; Utilization deficiency; Awareness gap; Training deficit; Motivation decline; Strengths-based interventions*

Introduction

Job performance is a multifaceted construct influenced by numerous factors. Motowidlo (2003) defines performance as behaviors that can impact organizational goal achievement, encompassing both positive and negative behaviors. Stasolla (2021) and Christiansen & Chandan (2017) elaborate on this definition, emphasizing task execution and adherence to standards as key components. Employee performance holds significant importance for organizational success, particularly in the public sector where pressure to enhance performance amid increasing public spending is prevalent (Curristine, 2006; Kim & Holzer, 2016; Radnor & McGuire, 2004).

Numerous factors affect employee job performance, including organizational culture, training, development, and job stress (Nikpour, 2017; Soomro & Shah, 2019; Rahman & Uddin, 2014). Additionally, individual characteristics such as gender, age, salary, stress, motivation, and job satisfaction play roles in determining performance outcomes (Dhani& Sharma, 2017; McEvoy & Cascio, 1989; Singh & Jain, 2013; Tampubolon, 2016).

Soft skills acquisition, ethical management, and behavioral traits have also been linked to job performance (Ibrahim et al., 2017; Atatsi et al., 2019; Bello, 2012). However, limited research in Ethiopia focuses on employee job performance and personality, particularly in the public sector (Negussie & Berehe, 2016; Liben, 2017; Hailesilasie, 2009).

Personality traits, including mood and character strengths, are increasingly recognized for their impact on job performance worldwide (Hogan Assessments, 2014; Chi et al., 2015). Studies have

shown that leveraging character strengths at work positively influences well-being and task performance (Pang & Ruch, 2019; Ramzan, Sattar & Amjad, 2022).

However, existing organizational studies in Ethiopia primarily focus on external factors influencing job performance, neglecting the role of internal factors such as character strengths (Negussie & Berehe, 2016; Liben, 2017; Hailesilasie, 2009). Thus, this study seeks to investigate the correlation between character strengths and job performance among Ethiopian public servants, with a focus on the revenue sector, aiming to address this research gap. The study addressed the following research questions:

1. Is there a relationship between employees' character strengths and their job performance in the revenue sector?
2. Among the six-character strengths, which one is the most significant predictor of job performance among Ethiopian revenue sector employees?
3. What is the perception of leaders in the revenue sector regarding the influence of character strengths on job performance?

Methodology

The research was conducted in Addis Ababa, Ethiopia's capital, a city with a diverse workforce of revenue sector employees. This diversity can help us understand how character strengths influence job performance. The City Administration and Federal Revenue offices play a crucial role in decision-making, potentially influencing nationwide policy implications.

The study used mixed research, combining quantitative and qualitative approaches to understand the relationship between character strength and work performance. For quantitative research, the study applied the formula for an unknown population size at 95% confidence level and the level of acceptance margin of error at 0.05%:

Where:

n = required sample size

Z = Z-score corresponding to the desired confidence level

p = estimated proportion of the population with the characteristic of interest

E = margin of error

Sample size for qualitative research was determined via purposive sampling and keeping the saturation principle in mind. Thus, a total of nineteen informants were contacted and interviewed at the desired public sector organization, namely, Revenue Sector.

Quantitative research involved employees and leaders, while qualitative research involved key informant interviews with revenue sector employees. The study used three instruments: an interview checklist for leaders, VIA-IS to identify employees' character strengths, and the Individual Work Performance Questionnaire (IWPQ) to investigate employees' work performance.

In this study, the signature character strength of employees is identified using the adult version of the Value in Action (VIA) assessment tool, the VIA Inventory of Strengths (VIA-IS). The VIA Classification identifies 24-character strengths, organized under six core virtues. A self-report survey is used to measure these strengths and virtues. Job performance is measured using the Individual Work Performance Questionnaire, an 18-item scale developed in The Netherlands.

Method of Data Analysis

For qualitative data, the data were analyzed using SPSS version 25. Pearson's product-moment correlation coefficient was used to analyze the correlation between six-character strengths and virtues and employee job performance. The interview episodes were digitally audiotaped, and the audio file was transcribed using verbatim transcription approach. The transcribed data were then

cleaned, edited, and checked for completeness and consistency. Translation of the data from Amharic to English was undertaken using Google Translate Software. The data were entered into an Office 365 Excel Data Entry template as a prerequisite for a specialized qualitative data analysis software. Finally, the data were analyzed using MAXqda 2022, a computer-assisted qualitative data analysis software (CAQDAS).

Results and Discussions

Demographic Background of Respondents

The workforce's largest age group is 31-40 (27.9%), followed by 21-30 (22.3%), with smaller percentages for 41-50 and 51-60. Among leaders, the 31-40 age group is also the largest (28.5%). Females constitute 33.2% of both employees and leaders, while males make up 29.5% and 28.7%, respectively. Individuals with 6-12 years of work experience are the most common in leadership roles (24.2%) and among employees (24.2%), while those with over 20 years of experience are the least represented (7.7% for employees, 2.9% for leaders). Leadership positions are more prevalent among experienced individuals. These informants, mostly male (84.2%), have varied work experience levels, with 53% having 0–5 years. Their roles include tax auditors (32%), income and accounting summary team leaders (16%), and work classification and personnel recruitment group coordinators (16%).

Relationship Between Employees' Character Strength (The Six Virtues) and Job Performance

To examine if there is a relationship between job performance and employees' character strength person correlation analyses were conducted the results are presented below.

The Relationship Between Employees' Work Performance and Strength of Courage

Table; 1 Strength Courage and Work Performance

Descriptive Statistics

	Mean	Std. Deviation	N
Performance	2.2361	.82402	376
Courage	4.2918	.68717	376

Pearson Correlations

		performance	Courage
Performance	Pearson Correlation	1	-.041
	Sig. (2-tailed)		.427
	N	376	376
Courage	Pearson Correlation	-.041	1
	Sig. (2-tailed)	.427	
	N	376	376

The correlation analysis examined the relationship between employees' courage strengths and job performance. Results showed a very weak negative correlation ($r = -0.041$), indicating a slight decrease in performance with higher courage levels ($p = 0.427$, non-significant). Descriptive statistics revealed an average work performance (mean = 2.2361) with moderate variability, while courage strengths were high (mean = 4.2918) with less variability.

The Relationship Between Employees' Work Performance and Their Strength of Humanity

Table; 2 Strength of Humanity and Work Performance

Descriptive Statistics

	Mean	Std. Deviation	N
Performance	2.2361	.82402	376
Humanity	4.3696	.58082	376

Pearson Correlations Statistics

		Performance	Humanity
Performance	Pearson Correlation	1	.015
	Sig. (2-tailed)		.778
	N	376	376
Humanity	Pearson Correlation	.015	1
	Sig. (2-tailed)	.778	
	N	376	376

Descriptive statistics reveal a higher mean for humanity (mean = 4.3696, SD = 0.58082) compared to performance (mean = 2.2361, SD = 0.82402), indicating condensed dispersion for humanity and larger variability for performance. Correlation analysis shows a weak positive association between humanity and productivity (r = 0.015, p = 0.778), suggesting no statistically significant correlation between job performance and humanity.

The Relationship Between Employees Work Performance and Strength of Humanity

Table 3 Strength of wisdom knowledge and work performance

Correlations

		Performance	wisdom
Performance	Pearson Correlation	1	-.040
	Sig. (2-tailed)		.442
	N	376	376
Wisdom	Pearson Correlation	-.040	1
	Sig. (2-tailed)	.442	
	N	376	376

Descriptive Statistics

Std. Deviation	N
.82402	376
.58117	376

A correlation analysis was conducted to assess the relationship between wisdom and job performance. The correlation coefficient was -0.040, indicating a weak negative correlation, but it was not statistically significant (p > 0.05). Descriptive statistics show a mean performance score

of 2.2361 with a standard deviation of 0.82402, while the mean wisdom score is 4.3059 with a lower standard deviation of 0.58117. This suggests a weak relationship between job performance and wisdom.

The Relationship Between Employees Work Performance and Strength of Justice

Table 4 Strength of Justice and Work Performance

Descriptive Statistics

	Mean	Std. Deviation	N
Performance	2.2361	.82402	376
Justice	4.3822	.61910	376

Correlations

		Performance	Justice
Performance	Pearson Correlation	1	-.016
	Sig. (2-tailed)		.751
	N	376	376
Justice	Pearson Correlation	-.016	1
	Sig. (2-tailed)	.751	
	N	376	376

Descriptive statistics display mean, standard deviation, and sample size for work performance and justice traits. Justice has a mean of 4.3822 (SD = 0.61910), while work performance has a mean of 2.2361 (SD = 0.82402) with 376 observations each. Correlation analysis shows a -0.016 Pearson correlation coefficient between performance and justice, suggesting a very weak negative association. However, the p-value (0.751) exceeds the significance level (0.05), indicating no statistically significant correlation between the variables.

The Relationship Between Employees' Work Performance and Strength of Temperance

Table 5 Temperance and work performance

Descriptive Statistics

	Mean	Std. Deviation	N
Performance	2.2361	.82402	376
Temperance	4.3496	.57196	376

Correlations

		Performance	Temperancee
Performance	Pearson Correlation	1	-.048
	Sig. (2-tailed)		.354
	N	376	376
Temperance	Pearson Correlation	-.048	1
	Sig. (2-tailed)	.354	
	N	376	376

There is a weak negative correlation (-0.048) between employees' work performance and their temperance trait, like other virtues, but it is not statistically significant (p = 0.354), indicating a chance association. The mean performance value (2.2361) suggests average performance among employees, with some variability (SD = 0.82402). In contrast, the mean temperance score (4.3818) indicates higher trait levels with less variability (SD = 0.56821), suggesting more consistency among employees in this trait.

The Relationship Between Employees' Work Performance and Strength Traits that of Transcendence

Table 6 Strength of Transcendence and Work Performance

Descriptive Statistics

	Mean	Std. Deviation	N
Performance	2.2361	.82402	376
Transcendencee	4.3818	.56821	376

Pearson Correlations

performance transcendence

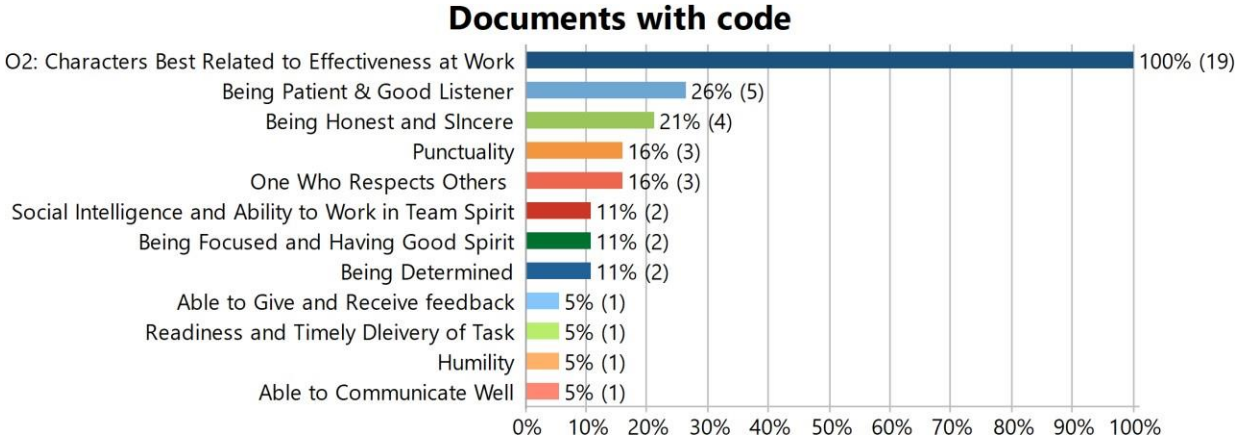
Performance	Pearson Correlation	1	-.045
	Sig. (2-tailed)		.381
	N	376	376
Transcendencee	Pearson Correlation	-.045	1
	Sig. (2-tailed)	.381	
	N	376	376

The table above illustrates a weak and non-significant correlation between workers' work performance and their character strength of transcendence. The correlation coefficient of -0.048 suggests a slight negative relationship, indicating that work performance may decrease slightly with higher levels of transcendence. However, the p-value of 0.354 indicates a 35.4% probability that this correlation occurred by chance.

Descriptive statistics offer additional insights. The mean performance score of 2.2361 reflects an average level of job performance among employees, with some variation around this mean. Conversely, the mean value for the transcendence trait is 4.3818, indicating a high level of this trait with less variability compared to performance scores. Overall, these results suggest that employees exhibit intermediate job performance levels, with some variability. While most employees perform adequately on average, there are variations in performance levels, with some excelling and others performing below average.

Findings from qualitative research appear to confirm the quantitative findings above. Regarding employee characters best related to effectiveness at work, analysis of the responses identified various qualities and behaviors that are believed to contribute to work efficiency. The most important character typesmentioned were *being patient and a good listener*; *being honest and sincere; punctuality; b*eingrespectful and social intelligence, among others.

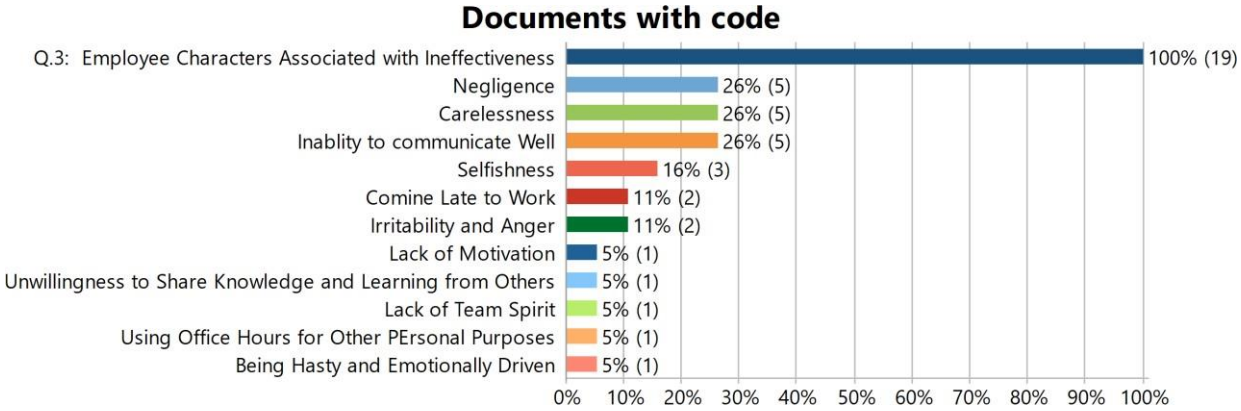
Figure 1: Most Mentioned Employee Characters Linked with Job Performance, KII,2023



Key qualities for work efficiency include effective communication, punctuality, cheerful outlook, teamwork, and personal attributes such as patience and honesty. In the quantitative study, only the strength of Humanity, involving caring interpersonal relationships, shows a positive but insignificant relationship with work performance. However, interviewees express skepticism about the direct link between behavior and work efficiency, emphasizing the importance of knowledge and skills. One key informant (FKI-9, 2023) expressed skepticism about the direct link between employee behavior and work efficiency. They observed instances where individuals with good behavior had better relationships but were not effective in their work. They believe that qualities like honesty, punctuality, or humility may not directly impact work efficiency, likening them to a protective cover. While they acknowledge some contribution of behavior to work efficiency, they suggest that other factors may play a more significant role.

Regarding employee characters associated with ineffectiveness at job performance the analysis identified various key employee characteristics that are associated with ineffectiveness in job performance. Negligence, carelessness, inability to communicate well, selfishness and coming to the office late were the five most salient ones mentioned by the informants.

Figure 2: Employee Behaviors Reported as Linked with Job Ineffectiveness, KII, 2023



Characteristics linked with job ineffectiveness include:

- Lack of teamwork: Inability to collaborate, resistance to change, and isolation.
- Lack of enthusiasm and motivation: Low motivation, dissatisfaction with work.
- Poor communication: Neglect, lack of listening, and rejection of others' ideas.
- Selfishness and arrogance: Selfish behavior, refusal to share knowledge, and arrogance.
- Lack of punctuality and professionalism: Tardiness, disrespect towards customers, and poor work

ethic.
- Negative attitudes: Pessimism, irritability, and hostility towards work and colleagues.
- Inability to adapt: Difficulty adjusting to new environments or office culture.
- Carelessness and negligence: Lack of attention to tasks and inability to manage responsibilities properly.

Exceptional cases mention external factors contributing to ineffectiveness, such as family pressures, inadequate infrastructure, wages, benefits, addiction, and personal issues. A female key informant (FKI-6, KII, 2023) highlighted the impact of family pressure on job performance, emphasizing the need for supportive workplace policies like childcare arrangements to alleviate such pressures. She also underscored the importance of adequate income, infrastructure, and benefits for work efficiency.

Most informants agree that improving employee behavior enhances work efficiency, citing positive attitudes, good character, and personal qualities like efficiency, humility, obedience, and humor as beneficial. They stress the importance of behavior-based training and experience sharing for productivity gains. However, some emphasize the significance of professional ethics and technical training alongside behavior development. External factors such as upbringing and societal influences are acknowledged to shape behavior, highlighting the need for individual and societal efforts to promote positive behavior.

Summarizing the findings from both quantitative and qualitative research, it is evident that, except for humanity, none of the six-character strengths show a significant positive association with employees' work performance. Descriptive statistics highlight variations in average performance and virtue scores, with employees scoring higher on virtues than on work performance. The standard deviation for work performance varies more compared to the more tightly clustered standard deviations for the six virtues, indicating less variability in virtue scores among employees. This could be due to employees aligning their behaviors with the virtues or potentially overstating their values on the questionnaire. The qualitative study revealed exceptions, such as individuals who, despite good relationships with superiors, struggle to have a good relationship with peers, impacting work effectiveness. One informant emphasized the importance of work ethic over personal behavior for success, suggesting that character alone may not suffice for work efficiency: “Character has little to do with it. Work ethics are mandatory rather than personal behavior. And success comes only from challenging work,” (SKI-9). Additionally, there is a mention of the importance of work ethic as a mandatory factor for success, suggesting that personal behavior alone may not be sufficient for work efficiency.

Discussion

Researchers in the field of positive psychology postulate that morally positively valued personality traits—character strengths—help people to flourish and lead them to good and right behavior (Peterson & Seligman, 2004). The right behavior can be productive or profitable (Peterson & Park, 2006) and therefore, it is hypothesized that the possession of specific characterstrengths is related to productive or profitable behavior at work (i.e., job performance). There is empirical evidence that character strengths do matter at work (Harzer & Ruch, 2014).

A study involving the assessment of the relationship between the level of 24-character strengths with overall job satisfaction in a general working population and in eight different occupational groups found that identifying individual signature character strengths for specific working populations and the occupational group is important in developing and applying strength-based interventions in the effort to improve organizational performance (Heintz & Ruch, 2020, p. 503).

Qualitative findings from our study yield a similar insight. Informants all underscored that, except for a few cases, the relevance of what they considered 'good characters' in enhancing work performance in the workplace.

Considering the conceptual and empirical issues alongside our results, it is recognized that character strengths significantly enhance employee job performance. Our findings explored how employees perceive good character strengths as positively impacting workplace behaviors, thereby boosting productivity. Informants highlighted that employee with positive behaviors, like teamwork, humility, honesty, and dedication, tend to contribute more to organizational goals.

Empirical studies suggest that individuals with higher zest scores are more likely to find their work fulfilling, leading to increased job satisfaction and fewer sick days (Peterson et al., 2010; Wrzesniewski et al., 1997; Pang & Ruch, 2019). This highlights the significance of character strengths in workplace outcomes like well-being and job performance (Pang & Ruch, 2019).

Our study emphasizes the paramount importance revenue sector employees place on character compared to professional knowledge or skills. As one informant wisely stated, "You cannot obtain a degree in character from a university" (FK 5-KII, 2023). Scholars note that while competence is crucial, virtuous character is necessary for consistently doing good (Park & Peterson, 2008). Without good character, individuals may lack the motivation to consistently act ethically (Park & Peterson, 2008).

The study indicates that informants agree on specific character traits that significantly impact job performance. These include willingness to learn, teamwork, humility, cheerfulness, and honesty, aligning with the 24-character strength model. This model categorizes traits into six groups known to positively influence job performance in organizations (Harzer & Ruch, 2014).

Employees demonstrating positive characteristics such as teamwork, mutual respect, creativity, and hope are more committed to their work, like findings by Henze and Ruch (2020). The top five signature character strengths align with those reported by Huber et al. (2020). However, conducive organizational contexts are necessary for these strengths to be effective, as noted by empirical studies (Huber et al., 2020; Park & Peterson, 2008). For instance, airline pilots' character strengths are influenced by the unique organizational culture of the airline industry (Littman-Ovadia & Raas-Rothschild, 2018). In the Ethiopian Revenue sector, key character strengths for job performance include time consciousness, dedication, mindfulness, and teamwork, with women often demonstrating maternal dedication and honesty (Littman-Ovadia & Raas-Rothschild, 2018). Teamwork is particularly crucial in the Revenue Sector, as it enhances work satisfaction and performance (Ruch et al., 2018).

In summary, only humanity among the six-character strengths shows a significant positive association with job performance. Descriptive statistics reveal varying mean performance and virtue scores. While character strengths influence work performance positively, several factors may lead to the opposite effect. Firstly, the relationship between character strengths and job performance varies based on job demands and organizational culture. Secondly, certain strengths, if not managed appropriately, can hinder performance, such as excessive assertiveness. Thirdly, lack of awareness of one's strengths may contribute to underperformance. Studies show that mindfulness of strengths positively impacts job satisfaction and engagement. Fourthly, incorporating character strengths into performance evaluations can provide a more holistic assessment. Finally, organizations can encourage the use of strengths through various engagement initiatives like workshops and coaching sessions. Taking a comprehensive approach to performance evaluation, considering objective metrics, feedback, and personality assessments, enables organizations to better understand individuals' performance and areas for development.

Additionally, fostering a culture that values and leverages character strengths through recognition programs and training workshops can empower employees. However, it is crucial to consider other factors like skills, experience, and external circumstances alongside character strengths' impact on job performance.

Conclusion

This study investigated the correlation between six-character strength virtues and job performance. Traits like willingness to learn, teamwork capacity, humility, cheerfulness, honesty, team spirit, mutual respect, creativity, and hope were found to correlate positively with work commitment, while selfishness and resistance to teamwork correlated negatively. However, quantitative findings revealed a discrepancy: higher work performance scores were associated with lower character strengths scores. To address this, researchers recommend integrating character strengths into performance appraisals and implementing employee engagement initiatives. Considering job requirements and organizational culture is crucial in analyzing this relationship. Third-party assessment of character strengths and consideration of other influencing factors are essential for fair evaluation. Qualitative interviews suggest that personal behavior, institutional culture, and environment influence job effectiveness beyond the examined character strengths. Therefore, caution is advised when interpreting the study's results.

Recommendations

Based on the study findings, the following key recommendations are forwarded:

- Integrate Character Strengths into Performance Appraisals: Incorporate character strengths assessment into performance evaluations to provide a more comprehensive understanding of employees' contributions.
- Implement Employee Engagement Initiatives: Develop initiatives that focus on enhancing employee engagement by leveraging their character strengths. This could include workshops, training sessions, and recognition programs.
- Consider Job Requirements and Organizational Culture: Recognize that the impact of character strengths on job performance may vary based on specific job demands and the organizational culture. Tailor interventions accordingly.
- Utilize Third-Party Assessment: Engage neutral third parties to assess employees' character strengths to ensure fairness and accuracy in evaluation processes.
- Account for Other Influencing Factors: Acknowledge the influence of personal behavior, institutional culture, and environmental factors on job effectiveness beyond the identified character strengths. Take a comprehensive approach to performance evaluation and development.

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3.4. Observance and Enforcement of Service Delivery Ethics in Ethiopia Civil Service Institutions

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Abstract

There has been considerable scientific debate on how to make the public sector function in the best way. This is because ethics matters mainly in developing countries where corruption and malpractices are prevalent. Like other developing countries Ethiopia public sectors are jam-packed with complex and various public complains due to mal-administrations and social injustice. Accordingly, this study attempted to examine the enforcement of service delivery ethics in Ethiopia Civil Service Institutions namely Adama City Revenue Offices, and Urban Land Administration Offices. To do so, it employed a mixed concurrent triangulation research approach. The data were collected using tools like survey questionnaires, interviews, and observations checklist. Using purposive and availability sampling about 799 questionnaires and 14 in-depth interviews were collected from the two civil service institutions mentioned above. The quantitative data manipulated using SPSS version 23 and analyzed employing descriptive statistics mainly frequency, percentage, and percentile rank. On the other hand, the qualitative data was analyzed thematically after it passed all stages of data clearing and coding (summarizing, categorizing and structuring of data). The study found that although there are written standard of conducts (ethics) in both Adama City Revenue and Urban Land Administration Office they are rarely practicing them. It found unethical behaviors like unfairness, discrimination and biases (ethnocentric thought), misuses of power, boredom, failure to respond promptly to customer complaints, egoism, slothfulness, carelessness, and hiding customer files in the public sectors. The study also found challenges such as weak institutional settings, poor implementation of laws and principles, egoism, low wages of employees (cost of living), and moral decay-fearless of God which hamper for the enforcement of service delivery ethics in the public sectors. The study finally suggests promotion of ethical leadership, modernizing service delivery systems, strengthening the institutions and strong controlling and follow-up system as mechanism for enforcement of service delivery ethics in the public sectors.

Key Words*: Enforcement, Ethics, Observance, Service Delivery, Public Sectors*

Introduction

Background and Rationale of the Study

Ethics refers to standards and practices that tell individuals on the way they supposed to act in voluminous situations in which they find themselves as children, parents, friends, citizens, businesspeople, professionals, and so on (Green et al., 2020; Kotalik et al., 2014). It can be also defined as liberal arts discipline that appraises voluntary human behavior as right or wrong with respect to formative principles (Christians et al., 1998). It is a way of studying morality which permits judgments to be made. It helps individuals to use their freedom responsibly and understand who they are

(Boatright, n.d). Moral and ethical values are strongly embedded in the very nature of society and in its spirituality and culture (Chowdhury, 2018; United Nations Educational, Scientific and Cultural Organization, 2003).

Ethics has different version in different settings viz. personal ethics, family ethics, community ethics, religious ethics, workplace ethics and so forth. Here, the concern is workplace ethics which defined as the set of values, moral doctrines, and principles that need to be followed by both employers and employees in the workplace. It is the set of rules and regulations that ought to be followed by all civil servants of that workplace. It is also called professional ethics (Omisore and Adeleke, 2015; Farland and Lombardo, 2023)

Ethics is the vital strand of any organization whether private or public. Enforcement of high service delivery ethics has umpteen importances. Being with other factors it determines the success or the failure of an organization (Committee on Standards in Public Life, 2014). Currently, in most countries, there are increasing expectations from ordinary citizens, business leaders and civil society organizations that governments need to establish and deliver higher standards of ethicality and integrity in its Civil Service institutions and agencies (Whitton, 2001). This is because high ethical standards are important for ensuring fairness and objectivity in the society and public service delivery institutions in general and respectively. It also believed to lessen corruption and other mal practices. In relation to this point, Committee on Standards in Public Life (2014) unveiled that implementing service delivery ethics has multitude importances to mention a few, increase fairness, integrity, impartiality, objectivity, and predictability that improve economic efficiency.

Likewise, Gilman (2015) unveiled that nowadays ethics is gaining acceptance while doing government business both in public and private sector. However, it has been observed that effective implementations of ethical standards in public service are going down. This raises questions about the costs of misconduct on the part of those who have been trusted with public interest and resources. Globally, the issues of corruption and unethical behavior in the public service have been receiving an increasing attention of academics, public service practitioners, politicians, media, and public (Khanal, Gupta and Bhattarai, 2022)

Ethical conduct and corruption in the public sector are the two sides of the same coin (Whitton, 2001). By implication organizations that are implementing high service delivery ethics are succeeded in enhancing customers' satisfactions and reducing corruptions and grievance. In view of this, there are three areas of concern that helps in solving the problems with the threat of corruption and other malpractices (problems of internalizing integrity and ethics in the civil services) for effective implementation of service delivery ethics. These areas are strengthening the ethical competence of civil servants, anticipating specific threats to ethics standards and integrity in the public sector, and strengthening mechanisms to support professional ethics, and developing administrative practices and processes which promote ethical values and integrity (Edukemy Team, 2019).

In developing countries, there has been significant progress made in recent years in developing effective civil service ethics, codes of conduct, transparency measures, ethics and integrity systems, and anti-corruption agencies though there are challenges in internalizing and implementing them in civil service institutions (Raja Sir's

Cracking IAS Academy, 2023). Ethiopian public service sectors are not unique in the regard.

The Ethiopian government has embarked on several reform initiatives to improve service delivery in the public sector (Tadesse, 2019). The reform initiatives undertaken by the Ethiopian government since the late 1990s include Business Process Reengineering (BPR), Balanced Scorecard (BSC), Change Army, Kaizen: service improvement, the citizen's charter, and deliverology. In addition, the government developed Service Delivery Policy aiming systematically arrange activities in giving service institutions with the aim of fulfilling the needs and expectation of service users with the optimum use of resources (FDRE, 2001). Despite these all initiatives, the public is still dissatisfied with the country's civil services. The main problem with these civil service institutions is believed to be poor adherence to service delivery ethics, ethical principles and integrity.

Besides the above facts and reasons, there are various concrete reasons to conduct a study on the enforcement of service delivery ethics in Ethiopia civil service institutions. The principal reason

is the dynamic need of the customers and static state (culture) of the civil service institutions which resulted dissatisfaction and malpractices for the customers. This paradoxical relationship requires timely inquest and accordingly remedy. The other reason is though there are plenty of studies on good governance, work ethics and related issues they are quite different from current study temporally, spatially, thematically and methodologically. For example, studies by Kure(2018) on Public Servants‟ Attitude towards Professional Ethics and Its Implication for Service Delivery in Selected Bureaus of the Oromia Regional State; Ghrmay (2020) New Public Management and Path Dependence in Public Organizations in Ethiopia: A Multiple Case Study; G/Egziaber (2016) An Exploration of Work Ethics in the Ethiopian Civil Service: The Case of Selected Federal Institutions, and Melese(2013) An Assessment of Good Governance in Ethiopian Civil Service: The Case of Ethiopian Ministry of Civil Service were undertaken.

As a backdrop, the purpose of this study was to identify the enforcement of service delivery ethics in civil service institutions. To this end, to achieve the objective of the study, the following basic research questions were stated:

1. What are the standards of conduct (ethics) that the civil service deliverer practicing?
2. Are there observances for service delivery ethics in the civil service institutions?
3. What is the perceived execution status of service delivery ethics in public service institutions?
4. What are the challenges in enforcement of service delivery ethics?
5. What are the mechanisms for enforcement of service delivery ethics in public service institutions?

Methodology

Study Area and Design

The study was conduct in Revenue Bureau and Urban Land Administration offices of the Adama city. These two institutions selected having in mind they have high number of customers at the same time persistent public complains target them.

Pertaining to the study design, it was a form of descriptive and exploratory study, employing concurrent mixed triangulation method. This was because some of its research objectives necessitate description about their status while others require a further exploration. About this, Babbie (2008) and Creswell (2009) stated that these methods of research are vital to explore a topic and to gather information about the present existing condition, respectively.

Population, Sampling and Sample Size

The target populations of the study were customers and service providers of Adama city Bureau of Revenues and Urban Land Administration Office. Since the population size of the study was unknown, large and heterogenous, the sample size was determined using Cochran's formula for calculating sample size. Moreover, this formula allows a researcher to calculate an ideal sample size given a desired level of precision, desired confidence level and the estimated proportion of the attribute present in the population (Kothari and Garg, 2014). And the calculation is as follows:

$$n = \frac{Z^2(P)(1-P)}{C^2} = \frac{(1.96)^2(0.5)(1-0.5)}{(0.05)^2} = 384.16 \sim 384$$

Where n is the required sample size, Z is the standard normal deviation set at 95% confidence level (1.96), P is percentage picking a choice or response (0.5) and C is confidence interval (5%=0.05). Considering the non-return rate, 5% samples were added to the actual sample which was 403. Accordingly, about 806 (403*2 public sector institutions) respondents and 14 in-depth interviews participants were taking part in the study in addition to systematic observation and document analysis. The study employed availability sampling and purposive sampling.

Source of Data and Instruments of Data Collection

The study generated data using primary and secondary sources. Accordingly, the primary data sources were obtained from customers, experts and mangers of the Urban Land Administration Office and Bureau of Revenue who were able to provide rich information on the subject whereas the secondary data source was from public grievance collection box (Complaint Box).

Pertaining to the instruments of data collection, the study employed standardized questionnaire, in-depth interview, and observations checklist. The standardized survey questionnaire was adapted from Lord Paul Bew (2014) Seven Principles of Public Life and United Nations Enforcement Service Delivery Ethics. The researcher also developed and added three questions. In addition to the close ended items, the researcher constructed open ended items that uniquely fit for each study's target population. Closed-ended and open-ended self-administered questionnaires were written in English and then translated into Amharic. Then, the Amharic document backtranslated into English to guarantee translation consistency. Finally, the survey questionnaire distributed for customers of the two public sector institutions.

In-depth interviews were conducted after interview guide points have been developed. All points addressed during the conversations were recorded using a tape recorder. In addition to the above two instruments, the study employed observation checklist and systematic observation to make observations on how officers/experts and mangers are handling their customers in the study area.

Pre-testing

For checking the reliability and validity of the instruments, the researcher distributed questionnaire for 30 respondents and interviewed 7 interviewees (to evaluate in-depth interview items), respectively. The reliability of the nineteen items for both Revenue Office, and Urban Land Administration Office was computed using Cronbach alpha, accordingly it was found above 0.93 and 0.91, respectively. These are a very good reliability index to measure the construct (variables) of the study. On the other hand, the face and content validity of the tools were examined by the

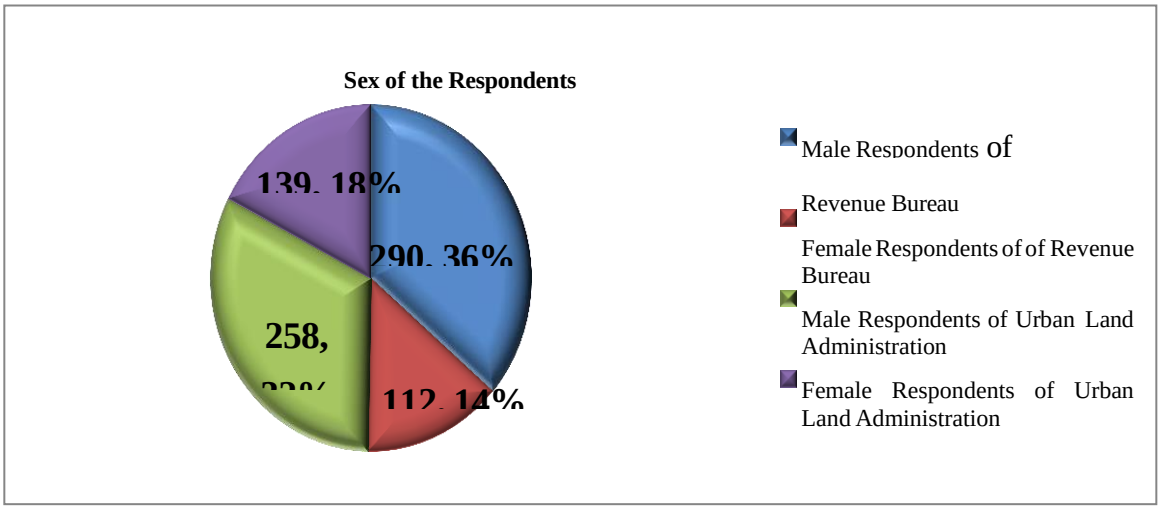
two public management experts of Ethiopian Civil Service University. The general feedback of the experts showed that the instruments do have very good content and face validity with minor modifications.

Methods of Data Analysis

Since the study employed mixed research approach, it incorporated both quantitative and qualitative data analysis tools. Accordingly, the quantitative data analyzed using frequencies, percentages, and percentile rank. The quantitative data demonstrated using graphs, pie charts, bar charts tables and other graphical representations.

On the other hand, the qualitative data analyzed thematically. The qualitative data passed all coding steps including summarizing, categorizing and structuring of data.

Results and Discussions



Demographic Characteristics of the Respondents

Figure 1: Sex of the Respondents; Source: Survey Result, 2022/2023

The above pie chart indicates that of seven hundred ninety -nine (799) who responded to the survey questionnaire, 367 (49%) were females whereas the rest 388 (51%) were males. When we see the sex demography of the respondents specific to the institutions, of four hundred two (402) revenue bureau respondents about 290 (72.1%) and 112(27.9%) were males and females, respectively. Relating to this, 258 (65%) males and 139 (35%) females' respondents (customers) of the Urban Land Administration office have participated in the study. These demographic figures entail that men account the major proportion in both Revenue Bureau and Urban Land Administration Offices.

Regarding the employment status of the respondents, all (402, 100%) the respondents of the Revenue Bureau were self-employed. Likewise, the highest proportion i.e. 195 (49.1%) of Urban Land Administration respondents were self-employed. In relation to this, the findings from the survey questionnaire and interviews, uncovered that the non-observance (lack of enforcement) of service delivery ethics (ignorance of public interest and laws, incompetency, lack of integrity, partiality, unaccountability and lack of transparency, corruptions and so forth) has been hampering this huge proportion of self-employed respondents' public lives (daily activities).

Congruent to this finding, Bertucci (2000) unlock that unethical and criminal practices in the public

sector is resulting in a loss of confidence in public institutions and an erosion of the rule of law. Alike Ifie, Mousavi, and Xie (2023) uncovered that lack of rule enforcement is a crucial part of the frontline service employee's role that, if mishandled, can have serious consequences for employees, customers and the organization.

Execution Status of Service Delivery Ethics in Adama Revenue Bureau and Urban Land Administration Offices

Execution Status of Service Delivery Ethics in Adama Revenue Bureau

Table 1: Execution Status of Service Delivery Ethics in Adama Revenue Bureau

Item(s)	S.NO	Items	Adama City Revenue Bureau								
			SA (7)	A (6)	SoA (5)	PRSA, A& SoA	N (4)	SoD (3)	D (2)	SD (1)	PRS oD, D& SD
Execution Status of Service Delivery	1	The City's Revenue Bureau executes its activities in accordance with the laws.	2	24	17	43 (10.7%)	5 (1.2%)	11	143	200	354 (88.1%)
	2	The City's Revenue Bureau act solely in terms of the public interest.	6	7	30	43 (10.7%)	6 (1.5%)	49	148	156	353 (87.8%)
	3	The City's Revenue office execute it activities with professional knowledge.	8	20	29	57 (14.2%)	23 (5.7%)	51	101	170	322 (80.1%)
	4	The City's Revenue office execute it activities with competency.	8	12	24	44 (10.9%)	16 (4%)	44	113	187	344 (85.6%)
	5	The City's Revenue Bureau has integrity in delivering services.	8	12	16	36 (10%)	22 (5.5%)	52	108	184	344 (85.5%)
	Grand					11.3%	**3.6**				85.4

Source: Survey Result, 2022/23

Key: SA: Strongly Agree, A: Agree, SoA: Somewhat agree, N: Neutral, SoD: Somewhat disagree, D: Disagree, SD: Strongly Disagree, $PR_{SoA,A\&SA}$: Percentile Rank of Somewhat agree, Agree and/or Strongly Agree, $PR_{SoD,D\&SD}$: Percentile Rank of Somewhat Disagree, Disagree and/or Strongly Disagree, G.PR: Grand Percentile Rank

Service delivery execution status items were administered to reveal the status of the service delivery ethics of Adama city Revenue Bureau. Thereupon, the frequency and percentile rank each item and their grand percentile rank were computed, the percentile rank of Somewhat agree/Agree and/or Strongly Agree of each item ($PR_{SoA,A\&SA}$ =10.7%, 10.7%, 14.2%, 10.9%, and 10%, respectively) and their grand percentile rank ($G.PR_{So,A\&SA}$=11.3%) is less than that of Somewhat disagree, Disagree and Strongly Disagree of each corresponding item ($PR_{SoD,\ D\&SD}$=88.1%, 87.8%, 80.1%, 85.6% and 85.5%) and their grand percentile rank ($G.PR_{S\ oDD\&SD}$= 85.4%).

Hence, these statistical figures entail that the items stated in the above table under the execution status of service delivery ethics namely, execution of activities in accordance with the laws, acting solely in terms of the public interest, and execution of activities with the professional knowledge,

competency and integrity were inversely noticed or rated as they are less likely executed among the Adama Revenue Bureau.

The findings from the in-depth interviewees and open-ended questionnaire support the quantitative findings. moral decay, fearless to God, incompetency and lack of knowledge, lack of integrity, lengthening appointment; unethical behavior like harassment, work shyness (slothfulness), carelessness', hiding customer files (documents), exaggerated estimation of daily sell and no money-no service (extreme love for money, self-centeredness). They uncovered that the officers are partial, unfair, and treat customers with discourtesy. In relation to this Bethel, Customer of Adama Revenue Bureau, stated her feelings saying:

"The office is fully corrupted. The officers don't welcome you. They are not punctual and don't finish your case with soon. They also absent from work. They give primacy for those who give money or their relative. Beneficiaries are requested to pay a bribe. If you don't give money, they elongate the services. Always give appointments."

(Bethel: April 2023).

Other interview participants, such as Gemeda, bolstered Bethel's idea. According to Gemeda,

> *"There is no rule in the office. If they (the officers) like they serve you, otherwise you may come for two-three months for a single case. They impose huge tax on you if you don't give corruptions. በራሳቸው ግምት ነው ግብር የሚያስከፍሉን እኛን ኣይሰሙንም፡፡ ያለመጠን ግብርን መወዘፍ. Many individuals are returning their business licenses due to the malpractice and harassment of the office."* (Gemeda: March 2023)

This finding is similar with Bertucci (2000) which uncovered that public sectors are characterized with poor discharging of their public service delivery ethics.

Consistent to this finding, Lues (2007) found that service delivery and ethical conduct in the public services are the two-missing links. Although there are a multitude of policies, strategies and programmes directed at the rendering of effective services to the customers by public service institutions, unethical behaviour, scandals and allegations are still made by public service providers.

The execution status of public service delivery items was administered to reveal the execution status of the service delivery ethics of Adama city Urban Land Administration. In view of that, the frequency and percentile rank each item, and their grand percentile rank were computed, the percentile rank of Somewhat agree/Agree and/or Strongly Agree of each item ($PR_{SoA,\ A\&SA}$ =13.1%, 9.3%, 12.8%, 9.1%, and 13.6%, respectively) and their grand percentile rank ($G.PR_{So,A\&SA}$=11.58%) is less than that of Somewhat disagree, Disagree and Strongly Disagree of each corresponding item ($PR_{SoD,D\&SD}$=85.9%, 89.9%, 84.4%, 88.9% and 84.9%) and their grand percentile rank($G.PR_{SoDD\&SD}$=86.8%).

Therefore, the items in the above table, these statistical facts indicate that there is hardly execution status of service delivery ethics among the Adama Urban Land Administration. Like the Revenue Bureau customers, findings from both interviews and open-ended questionnaire, the respondents from the Urban Land Administration revealed the multitude of unethical and behavioral problems they are facing. The most repeatedly stated misconducts were partiality, laziness, incompetency, ethnocentrism, reluctance to implement the government rules and procedures instead they create their own rules, disrespect, carelessness and ignorance, corruption, and egoism.

This study finding is congruent with Ahsan et al. (2023) which found that more than half of the stakeholders are not satisfied with existing urban land administration system, their governance and accountability, laws, and policies. In this regard, they revealed that corruption is prevalent mostly

in government organizations. Likewise, Gabrihet and Pillay (2021) unveiled that alike other many Sub-Sahara African countries, the Ethiopian urban land administration is characterized by governance challenges. In relation to this, the study unlocked as there are absence of accountability, the lack of transparency, little public participation, the existence of rampant corruption, and violation of the rule of law are the major determinants of customer levels of satisfaction. It revealed as there is a lack of quality service delivery and a fragile system of land governance.

Execution Status of Service Delivery Ethics in Adama Urban Land Administration

Table 2: Execution Status of Service Delivery Ethics in Adama Urban Land Administration

Item(s)	S.No	Items	Adama City Urban Land Administration								
			SA (7)	A (6)	SoA (5)	PRSA, A& SoA	N (4)	SoD (3)	D (2)	SD (1)	PRS oD, D& SD
Execution Status of Service Delivery	1	The City's Urban Land Administration executes its activities in accordance with the laws	6	21	25	52 (13.1%)	4 (1%)	28	108	205	341 (85.9%)
	2	The City's Urban Land Administration act solely in terms of the public interest.	2	11	24	37 (9.3%)	3 (0.8%)	49	123	185	357 (89.9%)
	3	The City's Urban Land Administration execute it activities with professional knowledge.	2	16	33	51 (12.8%)	11 (2.8%)	59	98	178	335 (84.4%)
	4	The City's Urban Land Administration execute it activities with competency.	0	15	21	36 (9.1%)	8 (2%)	53	113	187	353 (88.9%)
	5	The City's Urban Land Administration has integrity in delivering services.	1	16	37	54 (13.6%)	6 (1.5%)	43	108	186	337 (84.9%)
	Grand					11.58	1.62				86.8

Source: Survey Result, 2022/23

Enforcement of Service Delivery Ethics in Adama Revenue Bureau and Adama Urban Land Administration

This subsection present finding of the study pertaining to the observance and enforcement of service delivery ethics considering its openness and transparency, and efficiency and effectiveness.

Enforcement of Service Delivery Ethics in Adama Revenue Bureau

Openness and Transparency Adama Revenue Bureau

Table 3: Openness and Transparency of Adama Revenue Bureau

Item (s)	S. No	Items	Adama City Revenue								
			SA (7)	A (6)	SoA (5)	PR SA, A& SoA	N (4)	SoD (3)	D (2)	SD (1)	PR S oD, D& SD
Openness & Transparency (Adama Revenue Bureau)	1	The City's Revenue Bureau doesn't withheld information from the public unless there are clear and lawful reasons for so doing.	2	33	38	73 (18.2%)	35 (8.7%)	35	103	156	294 (85.9%)
	2	The City's Revenue Bureau Tax decisions are based on open & transparent information.	0	20	24	44 (10.9%)	19 (4.7%)	57	95	187	339 (84.3%)
	3	The City's Revenue Bureau takes tax decisions impartially using the best evidence.	4	3	22	29 (7.2%)	16 (4 %)	71	89	197	357 (88.8%)
	4	The City's Revenue Bureau tax decisions are fair.	1	3	12	16 (4%)	7 (1.7%)	42	111	226	379 (94.8%)
	5	The City's Revenue Office responds promptly to customer complaints.	0	2	12	14 (3.5%)	2 (0.5%)	37	108	238	383 (95.3%)
	6	The City's Revenue Office provides fair response to customer complaints.	1	1	11	13 (3.2%)	5 (1.2%)	35	98	251	384 (95.5%)
	7	The City's Revenue Bureau is free from corruption (malpractice).	2	4	18	24 (6%)	15 (3.7%)	13	85	265	363 (90.3%)
	8	The City's Revenue Bureau officials (employees) are accountable to the public for their decisions and actions.	9	18	37	64 (15.9%)	39 (9.7%)	56	87	156	299 (74.3%)
	9	The City's Revenue Bureau officials (employees) present themselves (required information) in an investigation to ensure that their decisions and actions are right by the public.	5	12	43	60 (14.9%)	32 (8%)	59	92	159	310 (77.1%)
	10	The city Revenue Bureau holds (implement) awareness programs that aims the payers to aware their rights and obligations.	4	9	39	52 (12.9%)	56 (13.9%)	27	60	206	293 (72.9%)
	Grand					9.7	5.6				76.4

Source: Survey Result, 2022/23

The openness and transparency items were administered to reveal whether there is the enforcement of service delivery ethics or not in Adama city Revenue Bureau. Consequently, frequency and percentile rank of each item and their grand percentile rank were computed. The percentile rank of Somewhat agree/Agree and/or Strongly Agree of each item ($PR_{SoA, A\&SA}$ =18.2%, 10.9%, 7.2%, 4%, 3.5%, 3.2%, 6%, 15.9%, 14.9% and 12.9%, respectively) and their grand percentile rank ($G.PR_{So,A\&SA}$=9.7%) is less than that of Somewhat disagree, Disagree and

Strongly Disagree of each corresponding item ($PR_{SoD,D\&SD}$=85.9%, 84.3%, 88.8%, 94.8%, 95.3%, 90.3%, 74.3%, 77.1% and 72.9%) and their grand percentile rank($G.PR_{SoDD\&SD}$=76.4%). These statistical facts show the Revenue Bureau of Adama city is not enforcing service delivery ethics which exemplified with withholding of information from public, lack of openness and transparency, unaccountable, partial, unfair, elongated or no response to the customers complains (lack of redressing customers complains), corruption (malpractice), and lack of consulations (awareness program) with customers.

The findings from in-depth interviews confirm the above quantitative findings. The interviewees uncovered that the Adama Revenue Bureau is intoxicated with various ethical misconducts and problems. They revealed many unethical behaviors of the officers (experts) like unfairness, discrimination and biases (ethnocentric thought), misuses of power, boredom, failure to respond promptly to customer complaints, egoism (self-centeredness, money-oriented thought to do so they magnify the estimation of daily sell of the customer), slothfulness, carelessness, hiding customer files (documents). In relation to this, an interview participant, Henok shared his feelings saying:

> "I have been visiting this office since 2009 E.C. I didn't notice any change. There is high corruption and other malpractices. The minds of the workers function with money. If you give money, you will get the services with short time unless you may come for months or year. They are ignorant to the work ethics and principles rather they formulate their own rules, corrupted and insincere. They are unfair, unaccountable and lack transparency. They are unaware of responsibility; they have unplanned work culture. They don't provide full and accurate information to the customers. There is poor controlling and follow-up system."
>
> (Henok: March 2023)

Congruent to the present findings, Lues (2007) uncovered that service delivery and ethical conduct in the public service are the two the missing links. It found that although there are a multitude of policies, strategies and programmes directed at the rendering of effective services to the customers by public service institutions, unethical behaviour, scandals and allegations are still made by public service providers. Similarly, Masenya and Mthombeni (2023) revealed that corruption and other ethical misconducts are now recognised as the greatest challenges with numerous consequences for public service delivery.

Alike to this finding, a study conducted in Nigeria unveiled that unethical behaviour of public servants is hurting the service delivery in Nigeria. The study found that unethical behaviors (unethical crisis) such as corruption, pervasive absence of accountability, new forms of cutting corners or what some writers have described as briberisation. The study identified that unethical behaviour in the Nigeria public service is high and unacceptable and has negatively affected quality service delivery and sustenance of services to the public (Onah et al., 2022).

Efficiency and Effectiveness of Adama Revenue Bureau

Table 4: Efficiency and Effectiveness of Adama Revenue Bureau

Item (s)	S. No	Items	Adama City Revenue								
			SA (7)	A (6)	SoA (5)	PRSA, A& SoA	N (4)	SoD (3)	D (2)	SD (1)	PRSoD, D& SD
Efficiency and Effectiveness ((Adama	1	The City's Revenue Bureau is friendly to its customers.	4	2	24	30 (7.5%)	2 (0.5%)	38	96	236	370 (92%)
	2	The City's Revenue Bureau is implementing a time and resource efficient system.	0	4	23	27 (6.7%)	16 (4%)	31	101	227	359 (89.3%)
	3	The City Revenue Bureau is working hard to enhance the customer satisfactions.	1	8	15	24 (6%)	10 (2.5 %)	37	79	252	368 (91.5%)
	Grand					6.7	2.3				90.9

Source: Survey Result, 2022/2023

The above table illustrates whether the Adama Revenue Bureau is efficient and effectives in provision of ethical service delivery or not. To do so, three efficiency and effectiveness items were administered, and the frequency and the percentile rank of each item and their grand percentile rank were computed. The percentile rank of Somewhat disagree, Disagree and Strongly Disagree of each corresponding item ($PR_{SoD,D\&SD}$=92%, 89.3%, and 91.5%) and their grand percentile rank($G.PR_{SoDD\&SD}$=90.9%) is greater than that of Somewhat agree/Agree and/or Strongly Agree of each item ($PR_{SoA,A\&SA}$ =7.5%, 6.7%, and 6%, respectively) and their grand percentile rank ($G.PR_{So,A\&SA}$=6.7%). These statistical figures implicate that the Revenue Bureau of Adama city is not efficient and effective (there is no observance and enforcement service delivery ethics) which documented with being unfriendly to the customers, lack of time and resource efficient system, and less likely to work on customer satisfaction. Concomitantly the qualitative findings support the quantitative findings. All the interview participants unlocked that the revenue bureau is characterized with poor controlling and follow-up system, non-conductive environment to the customers mainly for pregnant, patients, elders and disabled peoples. They also uncovered that the officers waste time (always being late, inefficient time usage), and provide boredom services. The bureau, as outlined by the participants, filled with officers who lack of training on the digital tax system and have culture lag. There are also wrong assignments persons on different customer service delivery positions. Moreover, the interviewee disclosed that there is incongruence between the numbers of service providers (officers) and service users (customers).

Enforcement of Service Delivery Ethics in Adama Urban Land Administration

Openness and Transparency of Adama Urban Land Administration

Table 5: Openness and Transparency of Adama Urban Land Administration

Item (s)	S. No	Items	Adama City Urban Land Administration								
			SA (7)	A (6)	SoA (5)	PR SA, A& SoA	N (4)	SoD (3)	D (2)	SD (1)	PR S oD, D& SD
Openness & Transparency (Adama Urban Land Administration)	1	The City's Urban Land Administration doesn't withheld information from the public unless there are clear and lawful reasons for so doing.	6	15	34	55 (13.9%)	62 (15.6%)	32	95	153	280 (70.5%)
	2	The City's Urban Land Administration is open & transparent.	2	17	33	52 (13.1%)	21 (5.3%)	51	97	176	324 (81.6%)
	3	The City's Urban Land Administration provides services impartially.	0	9	24	33 (8.3%)	14 (3.5%)	42	122	186	350 (88.2%)
	4	The City's Urban Land Administration provides services fairly.	0	12	20	32 (8.1%)	4 (1%)	44	104	213	361 (90.9%)
	5	The City's Urban Land Administration responds promptly to customer complaints.	0	7	24	31 (7.8%)	4 (1%)	26	107	229	362 (91.2%)
	6	The City's Urban Land Administration provides fair response to customer complaints.	0	5	19	14 (3.5%)	24 (6%)	52	82	230	364 (91.7%)
	7	The City's Urban Land Administration is free from corruption (malpractice).	3	3	20	26 (6.5%)	9 (2.3%)	31	82	249	362 (91.2%)
	8	The City's Urban Land Administration officials (employees) are accountable to the public for their decisions and actions.	14	23	35	72 (18.1%)	36 (9.1%)	34	60	195	289 (72.8%)
	9	The City's Urban Land Administration officials (employees) present themselves (required information) in an investigation to ensure that their decisions and actions are right by the public.	12	17	26	55 (13.9%)	27 (6.8%)	40	93	182	315 (79.3%)
	10	The city Urban Land Administration holds (implement) awareness programs that aims the payers to aware their rights and obligations.	2	17	43	62 (15.6%)	39 (9.8%)	47	60	189	296 (74.6%)
	Grand					10.9	6				83.2

Source: Survey Result, 2022/2023

The above table illustrates the frequency, percentile rank, and grand percentile rank to determine whether openness and transparency which are the components of service delivery ethics are being observed and enforced (implemented) or not in Adama City Urban Land Administration. Consequently, the computed percentile rank of Somewhat disagree, Disagree and Strongly Disagree of each corresponding item ($PR_{SoD,D\&SD}$=70.5%, 81.6%, 88.2%, 90.9%, 91.2%, 91.7%, 91.2%, 72.8%, 79.3% and 74.6%,respectively) and their grand percentile rank (G.PR $_{SoDD\&SD}$=

83.2%) is greater than that of Somewhat agree/Agree and/or Strongly Agree of each item ($PR_{SoA,A\&SA}$ =13.9%, 13.1%, 8.3%, 8.1%, 7.8%, 3.5%, 6.5%, 18.1%, 13.9%, and 15.6%, respectively) and their grand percentile rank (G.PRAdama So,A&SA=14%; G.PRDire Dawa So,A&SA=9%;). These statistical figures entail that that the items stated in the above table under openness and transparency specifically, withholding of information from public, lack of openness and transparency, unaccountable, partial, unfair, elongated or no response to the customers complains (lack of redressing customers complains), corruption (malpractice), and lack of consultations (awareness program) with customers are well documented non-observed and non-enforced service delivery ethics in Adama Urban Land Administration.

Harmonious to the above quantitative findings, the in-depth interview participants uncloaked that although there are written service delivery ethics and principles, they are less likely to observe and enforce them in Adama Urban Land Administration. Most participants uncovered that the Adama Urban Land Administration is characterized with partiality, unfairness, untrusted, insincerity and lack of transparency, laziness and ignorance of responsibility, ethnocentrism (considering ethnicity, religion & place of birth), less respect, carelessness and boredom service, unethical behavior like harassment, corrupt practices **(**No money-no service**;** extreme love for money), egoism, failure to respond promptly to customer complaints, and so forth. In relation to this, an interview participant named Gosa shared his feelings as follow:

"I visited the Adama Urban Land Administration for the first time. The officers are unpunctual, waste time and sometimes absent from the work. They don't serve customers politely. They give a very lengthy appointment. They are corrupted; they work favoring money and relatives. ገደብ ያጣ የመዋለ ንዋይ ፍቅር፣ ሰዎች ነገሮችን ያለገንዘብ መፈፀም አቅቷቸው የህሊና ህጋቸው ፍሬን እንደበጠሰ መኪና መስመር ከሳተ ብዙ ቆዮ. የግል ጥቅምን ማስቀደም፣ ያለ እጅ መንሻ ጉዳይን ለማስፈፀም አሰቸጋሪ መሆኑ ለሞያዊ ሥነ ምግባር ያለመገዛት። They are impartial, lack transparency and unaccountability. They work for their personal interest instead of public interest. They are fearless of God." Like the present findings, Kebede (2016) found major challenges in land administration systems. These challenges are absence of transparency, less participation of the public (customers), problem of responsiveness and inefficiency as well as ineffectiveness, technical and capacity problems. Likewise, Masenya and Mthombeni (2023) underscored that corruptions are becoming the greatest challenge in public sector. Alike Lues (2007) uncovered that service delivery and ethical conduct in the public service are the missing links. There are greatest unethical behaviors in the public sectors. Similarly, Ahsanet al. (2023) revealed that there are dissatisfactions, poor governance and unaccountability in land administration system in Pakistan.

Efficiency and Effectiveness of Adama Urban Land Administration

T*able 6: Efficiency and Effectiveness of Adama Urban Land Administration*

Item(s)	S. No	Items	Adama City Urban Land Administration								
			SA (7)	A (6)	SoA (5)	$PR_{SA, A\& SoA}$	N (4)	SoD (3)	D (2)	SD (1)	$PR_{S\ oD, D\& SD}$
Efficiency and Effectiveness ((Adama	1	The City's Urban Land Administration is friendly to its customers.	7	14	35	56 (14.1%)	7 (1.8%)	41	92	201	334 (84.1%)
	2	The City's Urban Land Administration is implementing a time and resource efficient system.	0	5	16	21 (5.3%)	10 (2.5%)	45	64	257	366 (92.2%)
	3	The City Urban Land Administration is working hard to enhance the customer satisfactions.	0	1	10	11 (2.8%)	12 (3 %)	42	85	247	374 (94.2%)
	Grand					**7.4**	**2.4**				**90.2**

Source: Survey Result, 2022/2023

The above table demonstrates whether the Adama Urban Land Administration is efficient and effectives in provision of ethical service delivery or not. Accordingly, frequency and the percentile rank of each item and their grand percentile rank were computed. The percentile rank of Somewhat disagree, Disagree and Strongly Disagree of each corresponding item ($PR_{SoD, D\&SD}$=84.1%, 92.2%, and 94.2%) and their grand percentile rank (G. $PRSoDD_{\&SD}$=90.2%) is greater than that of Somewhat agree/Agree and/or Strongly Agree of each item ($PR_{SoA, A\&SA}$ =14.1%, 5.3%, and 2.8%, respectively) and their grand percentile rank (G. $PRSo_{, A\&SA}$=6.7%). These statistical facts denote that the Urban Land Administration of Adama city is inefficient and ineffective which documented with being unfriendly to the customers, lack of time and resource efficient system, and dissatisfaction of customer.

The findings from qualitative data confirm the above quantitative data. It found that there is lack knowledge and familiarity with information management system (technology), culture lag, insufficient employees (experts), and inefficient use of time in Adama City Urban Land Administration.

Challenges for the Enforcement of Service Delivery Ethics

There are different challenges, outlined by the interview participants and respondents of the study, for the enforcement of service delivery ethics in both Revenue Bureau and Urban Land Administration of Adama City. The most stated are weak institutional settings, poor implementation of laws and principles (weak punishment), egoism, low wages of employees (cost of living), and moral decay-fearless of God.

Congruent to this finding, Mbandlwa, Dorasamy, and Fagbadebo (2020) disclosed that unethical leadership is prime factor for hardly enforcement of service deliver ethics in public sectors. They have proven that there is a link between leadership and service delivery. The study found that corruption is the results of poor ethics in leadership which results in poor public service delivery. Likewise, unveiled that inconvenience policies and procedures for land services implicate on the enforcement of service delivery ethics.

Mechanisms for Enforcement of Service Delivery Ethics

Both the respondents (from open ended questionnaire) and participants (from in-depth interview)

of the study outlined various mechanisms for enforcement of service delivery ethics in public sectors (Revenue Bureau and Urban Land Administration). To mention few:

- Consider public interest: In this regard, the offices better work on the ways of the reduction of egoism (fighting individualism), enhancing public centered services.
- Controlling: Ensure rule of law, punishment (imprisonment and humiliate in the public' confiscation of corrupted workers property which they stole from the public), zero tolerance for malpractice, correct conditions (systems) which create conducive environment for malpractice, reinforce the good doers whereas punish the wrong doers, promotion of ethical leadership and implementing strong controlling and follow-up system, establish and conduct a regular public hearings meetings establishing accountable and transparent system;
- Implement Modern Technology: Digitalizing service delivery system and using CCTV camera;
- Offering trainings for the experts: providing trainings (E.g Technology, Digital Tax System, Customer Handling, and Humans Dignity, Ethics) for the experts; Hiring/assigning ethical and competent experts for the job: increase the number of employees and their salaries.

Congruent to the present findings, Whitton (2014) found the mechanisms for enforcement of service delivery ethics in public sectors. These strategies are effective laws which require civil servants to give reasons for their official decisions, management approaches which encourage all public officials and civil servants to deal positively with corruption and unethical practice when they encounter it, ethics audits, training and development in the content and rationale of Ethics Codes, the application of ethical management principles, the proper use of official power, and the requirements of professional responsibility, and effective external and internal complaint and redress procedures.

Conclusions and Recommendations

Conclusions

Based on the findings of this study, the following conclusion were made:

The study found that although there are written standard of conducts (ethics) in both Adama City Revenue and Urban Land Administration Office they are rarely practicing them. The study found that the public sectors under the investigation do not observe and enforce the service delivery ethics they wrote on the gate of their offices. It found unethical behaviors like unfairness, discrimination and biases (ethnocentric thought), misuses of power, boredom, failure to respond promptly to customer complaints, egoism slothfulness, carelessness, and hiding customer files in the public sectors under investigation.

The study also found challenges such as weak institutional settings, poor implementation of laws and principles (weak punishment), egoism, low wages of employees (cost of living), and moral decay-fearless of God which hamper for the enforcement of service delivery ethics in the public sectors.

Moreover, the study found those mechanisms for enforcement of service delivery ethics in the public sectors. These mechanisms are considering public interest, strong controlling and follow-up systems, implementing modern technology and providing trainings.

Recommendations

The study has made the following recommendations based the findings and the identified gaps.

Promotion of Ethical Leadership: The problems non-enforcement of service delivery ethics is rooted with leadership problems. In this regard, there is a need to cultivate and create a system and employees (generation) that hates corruption as well as establish accountable and transparent

system. There is also a need to implement strong controlling and follow-up system. The leadership better **r**einforce the good doers while punishing the wrong doers (e.g. Confiscation of their property which they stole from the public and imprisonment). In addition, the public sectors better conduct regular public consultations and hearing meetings.

Modernizing Service Delivery Systems: The public sectors better digitalize the thier system and establishing strong follow-up system

Strengthening the Institutions: The study found that weak institutional settings is the main reason for non-observance and non-enforcement of service delivery ethics. Thus, the respective public sectors better to reform their institutions in such a way they can respond to the current needs of the society as well as the structural framework. This institutional reform better to comprise the professional development of the staffs because one of the challenges for enforcement of service delivery ethics is lack of knowledge and skill, and resistance to changes. It is also better to hire required number of expersts and assign the right person at the right positions.

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3.5. Exploring Urban Land and Housing Policy Implementation and Their Linkages in Bahir Dar, Ethiopia: Policy Analysis

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Abstracts

In rapidly expanding urban areas, the land and housing sectors necessitate closely linked with policies to guarantee that urban land and housing development benefit urban residents, particularly low-income households, through housing land provision. In practice, however, urban land policies are not closely linked with housing sector policies. Moreover, studies on analyzing urban land and housing linkages in Ethiopia from a policy viewpoint were limited. The study aimed to analyze the linkages between land and housing policies in urban Ethiopia, focusing on their impact on effective and efficient urban land supply and housing development. A mixed-methods research approach was used to achieve the study's objective by analyzing empirical and theoretical data using secondary sources. The data was gathered through desk and document reviews from Google searches and reports. The finding reveals that urban land institutions' inefficiency is due to a lack of a clear urban land-housing sector policy nexus, preventing private sector involvement. Land expropriation also faces resistance from farmers due to inadequate compensation, a lack of transparency leading to delayed urban land supply, and inadequate law enforcement, impacting housing investment and operating efficiency. Thus, the federal, state, and local governments must work together to build policy frameworks that strengthen the land-housing nexus. Significant policy reform, capable leadership assignments, robust institutions, stakeholder engagement, and public opinion collection are required to strengthen its ability to implement sectorial policies. Ultimately, this result has the potential to expand existing knowledge by identifying gaps and proposing solutions for sustainable urban development, including housing, nationwide and beyond.

Key Words: Affordable housing, institutional linkage, land administration, sector policy

Introduction

The land and housing administration sectors are required to be theoretically and practically linked to benefit urban residents through affordable housing and good land governance. Governments, civil society, the private sector, and international organizations need to collaborate to address major global development challenges. Linking land and housing policies is thus critical for institutions' ability to drive inclusive socio- economic growth, infrastructure investment, and equitable access to jobs and services by combining financial, technical, and human resources for low-income city dwellers (UNDP, 2017).

Urban land and urban people interact through the process of urbanization, which includes both social and spatial factors like buildings, infrastructure, and the built environment. Urban land availability supports development and socio-economic activities, highlighting the importance of land-housing policy linkage for improving people's lives and families over time. Thus, land-to-people linkages, an ancient human phenomenon, are evolving due to social-cultural and technological advancements, rapid urbanization, and sustainable development in previous civilizations (Adam, 2023).

Urbanization and land use dynamics significantly influence human impressions, affecting land, infrastructure, construction materials, technology, labor, and housing financing over time and space (Arjjumend and Seid, 2018; UN-Habitat, 2010). Thus, policies and institutional structures have a significant impact on land transactions and housing development, creating opportunities for local governments, private landowners, and cities. Hence, land and housing policies are essential to assess their linkages and develop effective land delivery solutions.

Land costs have an immense impact on urban housing costs, requiring more cost-effective measures. This indicates that existing laws and land tenure systems have an impact on housing availability (UN-Habitat, 2010). Thus, policies and institutional structures have a significant impact on land transactions and housing development, creating opportunities for local governments, private landowners, and cities. Hence, land and housing policies are essential to assess their linkages and develop effective land delivery solutions.

The World Bank Group's 2019 evaluation emphasizes Ethiopia's need for improved land management, affordable housing provision, governance, and funding to reduce urban slums and enhance housing quality. However, urban Ethiopia's housing shortage is exacerbated by inadequate land-housing policy linkages and insufficient data on land supply and demand. Moreover, Ethiopia's metropolitan centers, including Bahir Dar, despite the region's large population of 325,506 (Koroso et al., 2021), have affordability challenges due to weak policy links between the land and housing sectors.

In addition, some studies have focused on investigating the institutional capacity of urban land delivery and administration for housing development in Bahir Dar, Ethiopia (Emiru et al., 2023); institutional capacity as a barrier to delivering urban land for residential housing development in Ethiopia (Emiru, 2022); and revisiting the purpose of land policy efficiency and equity (Vejchodská et al., 2022). All previous studies have contributed to our current understanding of urban land performance and housing sector improvements. Despite attempts made, the current situation does not provide an accurate representation of the policy linkage between urban land and housing sectors in Ethiopia's urban areas. Furthermore, there is currently limited research on this issue in Ethiopia. As a result, policy-based research is needed to improve Ethiopia's institutional capacity to offer adequate urban land for housing.

The key research question is: how well are present land and housing policies linked to ensure effective and efficient urban land provision for housing in Ethiopian cities? This paper aims to investigate the policy linkage between Ethiopia's urban land and housing sectors to support efficient urban land supply for housing development.

Conceptualizing the Laws Governing Urban Land and Housing: A Policy Review

Land policy is a crucial aspect of national policies, influencing economic growth, power consolidation, poverty alleviation, environmental protection, settlement, equitable treatment, spatial planning, and land use planning (Vejchodská et al., 2022). That is why land laws regulate land operations, promote urban development, and assure transparency, efficiency, and equality, making them vital to urban economic growth and governance (UN-Habitat, 2021).

The 1995 FDRE Constitution in Ethiopia permits private property development, use, and sale, promoting investment and urbanization, but grants exclusive rights over land and natural resources to the state and people (FDRE, 1995). Thus, the state controls urban land development, maintaining ownership and establishing a 'negotiable right' (Alebel & Berihu, 2017), resulting in incompatible urban land ownership, leaving the poor and women out.

Moreover, due to Ethiopia's fast socioeconomic transformation, competition for peri-urban land is increasing, and land rights conflicts are becoming more visible (Adam, 2016). This results in unrealistic land use and unachievable urban development, requiring a flexible legal framework, land legislation reform, and enhanced housing supply chains to address Ethiopia's urban land and housing provision concerns. Table 1 shows Ethiopia's urban land and housing policies (1975–2019).

Table 1: *Urban land and housing regulatory policies in Ethiopia, 1975–2019*

Issuing body & date	Title of policy or law	Purpose of Policies or laws	Key implementation strategies
Ethiopia's Government July 26/1975	Government ownership of urban lands and extra-urban houses: Proclamation. No.47/1975	To reduce the artificial shortage of urban land and housing, and to provide opportunities for industrial and factory workers.	(a) All urban lands shall be the government's property. (b) No individual, family, or organisation has private urban land. ownership. (C) Urban lands were not subject to compensation.
FDRE Government, Sept. 11, 2003	Condominium Proclamation No. 370/2003.	Reduce the housing supply gap by offering alternative uses for high-rise apartments with limited space.	(a) Condominium registration and its consequences. (b) Amendments to the declaration rules and regulations.
FDRE. November 2011	Urban Lands Lease Holding Proclamation No. 721/2011.	Developing responsive institutions, an effective, efficient, and equitable land and property market, and a transparent and accountable land administration system.	(a) The right to lease urban land is permitted to realise common interests. (b) Urban land delivery must prioritise transparency and avoid unethical practices in public and urban centre development. (c) The tender shall reflect the prevailing transaction value of the land.
FDRE MUI, revised June 2016	Policies and Strategies for Urban Land Management	Ensuring proper sustainable land allocation and management for public spaces.	(a) Leaders and experts assist governments in developing exciting land policies. (b) Executive institutions should enhance their urban policy implementation capacity.
FDRE edit, March 2016	Urban Housing Policy and Strategy	Enhance urban housing to address shortages, meet demand, and ensure sustainable services.	Housing delivery modalities include government-coordinated, private- sector, housing cooperatives, and public-private partnerships.
FDRE September 23, 2019.	Proclamation 1161/2019: Land expropriation, compensation, and resettlement.	Addressing urban population growth, revitalising slums, attracting investment, and compensating landowners fairly.	(a) Land expropriation based on an approved land use plan or urban plan. (b) Resettlement and compensation must sustainably improve livelihoods. (c) The same comparison for economic losses in the same locations. Transparent and accountable land expropriation.

Methodology

Description of the case study area

Bahir Dar City was chosen as a case study to explore the challenges in the urban land and housing sector policy linkage. This is due to increasing urbanization, population growth, and housing shortages, which necessitate legal framework improvement. The World Bank (2015) predicts that future urban economic activities like agro-processing, tourism, conferences, research and development centers, and textiles will significantly impact the legal control of land and buildings in Bahir Dar, Ethiopia.

Ethiopia is an East African country, and its northern, southern, eastern, western, and south-eastern borders are with Eritrea, Kenya, Djibouti, Sudan (North and South), and Somalia, respectively. Ethiopia consists of 12 autonomous regions and two city administrations, including the Amhara National Regional State (ANRS), which is recognized by the FDRE constitution and consists of thirteen administrative zones and three metropolitan cities, one of which is Bahir Dar.

Bahir Dar, the ANRS' capital, has six sub-cities, 39 kebeles, and three satellite towns. Its

population is 325,506 (Koroso et al., 2021), and it is expected to reach 972,000 by 2035 (World Bank, 2015). Thus, Bahir Dar was selected as a case study location due to insufficient policy links affecting urban land and housing development.

Research approaches

This section explains the method for answering and explaining the research questions by utilizing a mixed- methods approach, which can be summarized as conceptualization, implementation, interpretation, and outcome. The study investigates the evidence-based linkages between urban land and housing sector policy and how they affect the efficiency of residential land delivery in Bahir Dar, Ethiopia. This could be achieved through analyzing quantitative and qualitative data from policy documents, previous studies, and unpublished reports.

A two-stage research process was developed to explore the linkage between land and the housing sector in facilitating land delivery for housing development. The first stage analyzes land and housing policy frameworks to investigate existing sectoral linkages between urban land and housing. The subsequent stage evaluates the policy's impact on urban land preparation and delivery for housing, focusing on its effectiveness and efficiency. This could use secondary data from a 5-year report (2019/20-2023/24) from Bahir Dar municipality, Ethiopia, to identify gaps in urban land demand and supply. The study used statistical analysis, particularly the results of the T-test and paired sample correlation, to compare the means of two variables (supply and demand) for residential development over five years.

Therefore, the weaknesses of the linkage between urban land and housing policy are triangulated using evidence from land delivery trends and performance reports in the case study area.

Data Collection and Analysis Methods

Secondary data sources on urban land and housing policy issues were collected through desk and document reviews. Since documentation plays an important role in social research, it reveals beliefs, opinions, and behaviors. Secondary data was used to achieve the study's objectives through qualitative and quantitative approaches.

The data analysis method utilized exploratory and mixed methods approaches, with a focus on examining theoretical and functional linkages in urban land and housing policies. Descriptive statistics and average values were used to analyze quantitative data from case area housing land delivery performance over the period 2019/20-2023/24. This was done to triangulate the impact of insufficient policy linkage on urban land delivery performance and to identify a demand-supply gap. The study analyzed qualitative data from theories and policy documents, along with data from prior studies in related domains. The aim is to identify supply and demand gaps and assess the impact of land administration policies on housing land delivery.

It was organized using both descriptive and exploratory analysis, with questions and objectives based on concepts and a qualitative structure. The study presents findings from scientific articles, policy documents, and document analysis in tables and text, identifying gaps and drawing conclusions and recommendations. However, due to paper page limits and time and financial constraints, the study only examined certain urban land documents rather than all policy papers and performance reports.

Results and Discussion

The section analyses Ethiopia's urban land and housing sector policies, their implementation, and the resulting impacts as institutional capacity challenges when delivering urban land for housing in Bahir Dar, Ethiopia.

Ethiopia's urban land and housing policy analysis

Proclamation 47/1975

In 1975, the Derg issued a proclamation that allowed the state to own urban land and extra-urban houses. This decision aimed to address the shortage of housing for feudal lords, noblemen, government officials, and capitalists. The proclamation was expected to create more opportunities for industrial and factory workers in the areas where they lived (Derg, 1975). However, the law does not grant industrial workers land and housing rights but instead forms a government monopoly, preventing private ownership and compensation claims. Therefore, the state's ownership of urban land hinders urban development, particularly housing, and contributes to the urban housing shortage.

The FDRE Constitution 1995

The FDRE Constitution encourages investment and urban expansion through urban land laws and regulations, guaranteeing that every person has the right to develop, utilize, and transfer private property under articles 40(1) and (2) of the Constitution (FDRE, 1995). However, article 40(3) of the Constitution guarantees the government, nations, and nationalities ownership of urban land, thus prohibiting private land ownership. Previous research indicates that the Constitution differentiates between the right to use and own land, allowing the state to maintain land ownership while offering a negotiated right of use (Alebel Berihu, 2017).

Therefore, the state's land policy was incorporated in the constitution, replacing Marxist ideology with a revolutionary and developmental state. Thus, the typical conflict between equity and efficiency persists in urban land.

Condominium Proclamation No. 370/2003

The Condominium Proclamation seeks to alleviate housing shortages by providing urban land-use alternatives, assisting those who would not have previously owned a home, alleviating slum conditions, and creating jobs (FDRE, 2003). However, the program has underperformed, with only 42.75% of the 400,000 planned housing units constructed, indicating insufficient coverage of housing needs in cities like Bahir Dar due to weak land delivery and financial shortages. Hence, the IHDP failed to satisfy demand, excluding 40% of the population from market access and covering only 10% of annual demand (World Bank Group, 2019).

The analysis finds that Ethiopia's IHDP confronts obstacles such as poor management, insufficient land development, leadership issues, and financial scarcity, which lead to unsustainable subsidies and programs, causing delays and affordability issues.

Urban housing policy and strategy (2016)

The policy aims to address housing shortages, increase capacity, provide sustainable development services, implement urban growth regulations, revitalize metropolitan areas, promote socio-economic development, and encourage private sector collaboration (FDRE, 2016a). However, the government and private sector are currently not collaborating on managing housing difficulties, technology solutions, data exchange, and access to data for urban plots and housing construction. Hence, the government's urban land policy neglects the private sector's role in land delivery, resulting in inadequate housing production. Thus, housing development policy acknowledges the current housing shortage and private sector role but is not linked with urban land policy in problem-solving mechanisms.

Urban land policy and strategy (2016)

Ethiopia's urban land policy aims for sustainable development, housing, and public space delivery, with the government as the sole urban land provider and having significant impacts on housing policies (FDRE, 2016b). However, the policy recognizes urban development challenges like

housing shortages and land unavailability but ignores the private sector's role in land supply. It is also not linked with housing policy in problem-solving approaches (Emiru, 2022). Hence, analyzing urban land and housing policy is crucial to bridging conceptual and practical gaps.
Moreover, previous empirical research reveals challenges in urban land policy, including rising land prices, bureaucratic institutionalization, insufficient monitoring, and a lack of transparency in service delivery. Ethiopia's land allocation processes are mostly based on competitive bidding systems that favor wealthy households (Arjjumend & Seid, 2018). Consequently, the current urban land administration system in Ethiopia faces challenges like unclear policies, weak institutions, limited public participation, and capability gaps. The situation presents potential opportunities for corruption, requiring immediate action to tackle systemic issues.

The holding of urban land leases 721/2011

Ethiopia's urban land tenure principles permit leasehold agreements for urban development, with rental terms ranging from 5 to 99 years, with the longest being for residential purposes (FDRE, 2011). Thus, the right to use and lease requires transparent and accountable land transfer processes. However, the proclamation confines urban landowners to leaseholds, creating distrust in land ownership and discouraging housing developers from investing. Similarly, urban residents suffer limited developable land for housing, leading to illegal land acquisitions through misled leasehold conversion programs and unrealistic zoning regulations.
A previous study indicates that due to socioeconomic shifts and development pressures, Ethiopia's peri-urban land competition is increasing, resulting in more visible land rights conflicts (Adam, 2016). Similarly, Ethiopia's failure to establish efficient linkages between the land and housing sectors through strong policy resulted in insufficient urban land for affordable housing development, leading to illegal land ownership.

FDRE land expropriation proclamation 1161/2019

The land expropriation proclamation regulates land usage for socioeconomic purposes to improve public services and urban development while also compensating landowners fairly (FDRE, 2019). However, despite recent amendments, it leads to unfair competition and lower property security. Hence, Ethiopia's rigid land laws hinder urban land-housing policy linkage, impacting per-urban landowners, homeless urban residents, and future housing investments. Moreover, land expropriation in Ethiopia encountered resistance from farmers because of unfair compensation and a lack of transparency before and after compensation (Arjjumend & Seid, 2018). Hence, urban land policies lack coherence, flexibility, and governance in housing land allocation due to inefficiency and a lack of policy linkage.
It will be important for policymakers to anticipate and proactively address these challenges to ensure that future policies are more effective and sustainable. The text highlights the importance of considering various factors like legal, institutional, economic, technical, and political will while addressing global land and housing policy challenges (UN-Habitat, 2021). Looking ahead, it is likely that Ethiopia's land and housing policies and implementation strategies will need to be reviewed to address the issues posed by legislation that was in place between 1975 and 2019, and which has often failed to deliver satisfactory results.
To sum up this section, affordable housing and developable urban land are crucial for sustainable urban development, with effective implementation strategies guiding land use and administration to achieve social, environmental, and economic objectives.
However, despite the importance of urban land and housing policies, the government has not given enough attention to urban land and housing policies, failing to meet the demand for housing. This

is due to a lack of linkage between the two policies and a failure to implement effective reforms. As a result, the urban land and housing sector's efficiency has decreased, hindering its overall growth and development.

To improve the situation, the government must prioritize the reform and implementation of policies that support the urban land and housing sectors. This will enable the sectors to maximize their development advantages. It is crucial to ensure that the policies are balanced and equitable for all stakeholders, including low-income households. Additionally, implementing effective policies will help to address the existing housing deficit, reduce homelessness, and promote sustainable urban development.

In conclusion, improving the linkages between urban lands and housing policies is essential to achieving the planned housing demand and promoting sustainable urban growth. The government must commit to reforming and implementing policies that support the housing and urban land sectors for optimal performance and efficiency.

Implication of weak policy linkage on urban land delivery performance

In Ethiopia, the policy analysis has shed light on the need for stronger linkages between urban land and housing policies to address the housing shortage. Despite facing a weak land-housing law nexus, the real estate market in Bahir Dar and other areas is rising to the challenge of fulfilling the annual demand for 381,000 housing units due to urbanization (World Bank Group, 2019). To get a better understanding, Table 2 compares the affordability and adequacy of residential urban land supply for housing to the demand in the case study over the last 5 years.

In the past five years, Bahir Dar has only provided 9.1404 hectares of urban land for residential housing. Out of 32,931 people who showed interest in buying land, only 55.3% went through with the process and reported the prices. Unfortunately, only 578 (1.75%) of those buyers benefited from the purchase. The government's lack of policy on alternative housing solutions has led to a significant shortfall in supply, with 32,353 plots, or 98.25%, not being put up for sale as required. The statistical analysis demonstrates that the government's emphasis on policy execution has remained largely stagnant, resulting in weaker links between urban lands and housing sector policies and ultimately leading to housing productivity gaps. The study utilized a paired sample t-test, which confirms that there is a significant gap between the demand and supply of urban land. When the demand-supply comparison shows no gap, a paired sample difference equals zero. However, where a gap exists, the difference is not equal to zero, as indicated in Table 3.

Table 2: Urban land prepared and transferred in Bahir Dar over five years via a lease auction

fiscal year	Land offered/ provided for auction by parcels. & hectares					Land seekers who participated in the auction every year			The highest and the lower price per square meter				bidding rounds
									Rresidential m2/EBr.		Business m2/in EBr.		
	residential		business	service	Total	Purchase document	compete with price	benifi ciares	highest	Least	highest	Least	
	par	hector											
2019	99	2,0436	3.8333	2.3063	8.2832	3218	2967	99	51,100	20000	23900	6178	1+1
2020	124	1.8570	3.1820		5.0390	5459	4403	124	61978	30000	54200	6011.	01
2021	162	1.9780	5.9490		7.9270	8035	6563	162	83010	33778	63560	24582	02
2022	77	1.1937	5.3740		6.5677	2516	2191	77	83260	36551	67001	27522	01
2023	116	2.0681	3.1307		5,1988	13703	2090	116	205500	82157	105250	65655	01
Total	578	9.1404	25.7753		34.9157	32,931	18214	578					7

Over the past five years, auctioned land supply has been 12,317.40 points below residential demand, indicating a mismatch between urban land supply and demand. The gap analysis aims to

improve the performance of land and housing institutions by establishing sound policy links. Therefore, weak land and housing policy linkages in cities might hinder initiatives to improve urban land supply and housing development. The government's inability to implement housing and land policies effectively has created a significant housing demand-supply gap. It's high time to reconsider the policy and strategies from a public-benefit perspective to tackle the housing crisis

Table 3: Results of T-test and descriptive statistics for supply and demand for residential housing

	Paired difference							r	t	d f	Sig-(2-tailed)
	Mean(M)			Standard division (SD)		95% confidence interval of difference					
	supply	demand	difference	supply	demand	lower	upper				
Supplied-demanded	211.40	12,528.80	-12,317.40	207.15	12,124.40	-27,128.20	2,493.40	.95	-2.31	4	.082

*P>0.05

Our rigorous analysis of the performance of urban land delivery over five years in response to the demand for residential land has revealed a striking and statistically significant difference in the mean weight of housing land supply (M = 211.40; SD = 207.15) and housing land demand (M = 12,528.80; SD = 12,124.4) at the threshold of 0.05 (t =-2.31; df = 4; n = 5; P >0.05; 95% confidence interval -27,128.20 to 2,493.40; r = 0.95). According to the statistics, the supply of land available for auction was 12,317.40 points less than the average demand for residential land. This gap analysis compares the performance of urban land institutions in terms of land supply with the actual amount of land required by city residents. This result provides strong evidence that the housing land supply is insufficient to meet the demand, necessitating further investigation and action to address this issue.

Therefore, the gap analysis aims to improve the performance of land and housing institutions by linking the land management paradigm with the complex nature of the housing construction process through sound policy. Hence, the study area's land administration institutions are underperforming as a result of a weak link between urban land and housing policy frameworks, insufficient policy formation, and a lack of focus from local governments to enforce current laws.The findings indicate that there is a lack of residential land availability in Bahir Dar, Ethiopia, which has been unable to keep up with increased demand over the last five years. This indicates the need for a strong linkage between institutions responsible for land management and housing agencies' policies. This is further supported by a previous report from UN-Habitat (2021), which highlights that families with low to moderate income are not eligible to acquire residential plots of land in Bahir Dar through bidding.

Finally, Ethiopia has faced challenges in the urban land and housing sectors, including policy rigidity, institutional structures, and a lack of capable leadership. Thus, developing a strong policy link between housing and urban land can help to mitigate challenges. As a result, the success of Ethiopia's urban land and housing sectors depends on the government's commitment to reform and implement policies that improve sector performance.

Conclusions and Recommendations

To effectively optimize urban land and housing development, it is critical to build strong and practical policy links between the two sectors. However, in Ethiopia, particularly in Bahir Dar, inadequate policy execution has impeded effective urban land development and supply, significantly impacting the availability of affordable housing for homeless residents. This

situation vividly illustrates that the lack of proper policy linkages between the urban land and housing sectors has resulted in ineffective urban land administration and housing development in the area. As a result, the housing problem in Bahir Dar can be attributed to weak policy implementation, decision-making, and land provision by municipal land administration authorities. It is imperative to resolve these issues to ensure that the urban land and housing sectors work together harmoniously to provide better living conditions for all residents.

Unfortunately, access to urban land is a significant challenge in Ethiopia, but weak land governance has made it even more difficult to provide affordable housing to the homeless population. To address this issue, consistent, realistic, and harmonized sectorial policies are required to govern urban land and housing in the country. The federal and state governments must work together to create policy frameworks that strengthen the link between land and housing. Achieving this requires substantial reform of land and housing policies, capable leadership, and structurally sound institutions. The Bahir Dar city administration must urgently improve its capacity for implementing sectorial policies by identifying existing challenges, appointing

competent leaders, engaging stakeholders in the policy implementation process, and collecting public opinion on the issue. Additionally, to ensure affordable housing provision, there is a need to increase the availability of building materials and urban land supplies. With these reforms, Ethiopia can make urban land available for residential housing and improve the lives of its citizens.

Through taking these courageous measures, we can confidently achieve our objectives. Ultimately, our findings and recommendations will improve urban land and housing sector policy reform and implementation, thereby benefiting other cities across the country

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3.6. Status of Core Competency Skills of Employees in Public Sectors of Ethiopia

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Abstract

The primary objective of this research is to assess the Core Competency Skills of employees within the public sectors of Ethiopia. The study employed a comprehensive approach, utilizing a descriptive survey and explanatory research design to gather and analyze data. Both primary and secondary data collection methods were employed, with primary data obtained through questionnaires and focus group discussions. A robust response rate of 98% was achieved from a sample size of 1600 randomly selected employees. The statistical analysis, conducted using SPSS version 25, unveiled those employees demonstrated moderate proficiency in essential areas such as customer service, communication, and teamwork. However, significant gaps were identified in fundamental competencies, particularly in decision-making and technology utilization. These findings underscore the pressing need for targeted training initiatives to enhance core competency skills and address skill deficiencies prevalent within the Ethiopian Public service sectors. To bolster competency levels and bridge skill gaps, it is recommended that organizations prioritize employee engagement, motivation, and the implementation of tailored training programs. Standardized assessments and clearly defined competency development goals should be established to promote staff proficiency and foster continuous competence enhancement within public sector entities. In conclusion, this study sheds light on the critical importance of investing in employee training and development to bolster core competency skills among public sector workers in Ethiopia. By implementing strategic interventions aimed at enhancing employee competencies, organizations can cultivate a more skilled and proficient workforce, ultimately driving improved performance and service delivery.

Keywords: *Core Competency Public Sector Competency Skills*

Introduction

Background of The Study

The history of "modern" Civil Service in Ethiopia dates to 1907 (Binyam & Elias, 2019). Since that time now, one hundred plus solid years had elapsed, nevertheless, despite this long experience of civil service, the in-efficiency and in-effectiveness of the sector continues to date. To curb such problems, different governments' that comes to the scene takes various reform initiatives. However, the problem persisted for long, and our Civil service still performs below the expected standard. Binyam and Elias, 2019 indicates the magnitude of the problem using short & meaningful phrase that "the Ethiopian civil service was plagued with a multitude of factors that hinders the effective delivery of services." Few of these factors are lack of neutral policy implementer, non-responsiveness to public interest, lack of transparency, and accountability, among others.

In consolidating the above argument, Meskerem, Fetiya and Selamawit, (2019), and Zerihuen & Tesfaye (2014); as cited in Binyam & Elias (2019) also confirmed the high-level inefficiency and ineffectiveness of the Ethiopian Civil Service. In this case being ineffective means not doing the

appropriate task as per the expected standard, while being inefficient refers to doing the task incorrectly with maximum possible cost and wastage of resources.

In modern civil service, competent human power has taken as one of the key determinant factors for success and one of the critical problems that hamper the effectiveness of the Ethiopian Civil Service was employees' low level of competence. Various research findings confirm this reality; nonetheless no research that explicitly showed the area and type of competencies that plays a determining role in improving employees' competence and then organizational effectiveness and efficiency, in Ethiopia has done. Therefore, the question one can pose here is which area or types of competences are playing a crucial role in facilitating or de-facilitating the efficiency and effectiveness of the sector.

Recent studies on employees' competences confirmed the prevalence of global skill shortage in general and mismatch between the competency's employees possessed and required for job position, either at job entry or continual period. It appears that employees' current competencies are not aligned with the skill needs of the 21st century's the sector demand; hence civil service institutions need to make diagnosis on the gaps to prescribe the right medicine that relive the patient (the Ethiopian civil service) from the illness. This may consequently help firms to identify and bridge the gap to improve workers employability competencies and productivity. Countries all over the world as well as organizations have made great effort to close such competency deficit and improve their government services by taking different initiatives.

In cognizant of the problem, the Ethiopian government has attempted to implement various reforms, ranging from the old Structural Adjustment Program (SAP) to the new Competency Based Human Resource Management, to improve the competencies of civil servants. However, research results revealed that these reform initiatives have not gained with the required results. Despite this fact the government effort continued. Especially the Civil Servants Proclamation No 1064/2017 clearly states the importance of installing competency framework to the Ethiopian Civil Servants. Following this, the Ethiopian Civil Service Commission has made various efforts to formulate competency frameworks, which includes 'core competency' framework. The commission by now has identified 11 'core competencies' that have clustered under three groups. These competencies have a cross-cutting nature and believed to complement formal education or organizational or industry knowledge that may be a prerequisite for job. This means, these core competencies readily work to all civil servants of the nation from top to down.

Nonetheless, 'Competence' and/or 'competency' are a multifaceted, multilevel and ambiguous terms that needs to be re-defined and re-conceptualized in the current Ethiopian context. To this end, the civil servant's proclamation No 1064/2017, which serves as a policy document that gives an overall direction to the works of the national civil service in Ethiopia couldn't explicitly define it. Therefore, at this very time finding meaning for the term 'competence' from the context of the Ethiopian civil service and reach into consensus may be some how difficult.

In connection to the problem, Ronald Zemeke, (1982); cited in R. Palanjappan, (2003) comments on the confusion these terms create and called them, 'Humpty Dumpty Words"; meaning only what the definer wants them to mean. In supporting this idea, Mulenga & Kabombwe, (2019), stated that these two terms are sometimes confused & misused in the literature. Literally, 'competency' refers to the specific ability or skill of the person, while 'competence' is the ability to do something well. However, Kouwenhoven (2009) conceptualize these two terms as; "competency is the capability to choose and use (apply) an integrated combination of knowledge, skill and attitudes with the intention to realize a task; whereas competence is the capacity to realize the key occupational tasks that characterize a profession."

In conferring to the above idea, Armstrong (2005) as cited in Mulenga and Kabombwe (2019), briefly explained that whilst competency is a person related concept, competence is a work-related concept. Likewise, to Zemeke, (1982) competency refers to a description of behavior that implies what people are and can do, not what they do; whereas competence is a description of work tasks or job out-puts the job holders need to do, what they need to know and how best to achieve standards that are nationally recognized. Therefore, the purpose of this study is to examine the status of Ethiopian Civil Servants towards the nationally identified eleven core competencies.

Statement of the Problem

The concept 21stCentury skills have no single set of exhaustive meaning and list. However, the major essence of it is giving due emphasis on what employees' do or perform with knowledge they possess from their education and day to day life experience than what portion of knowledge they cover during schooling. In this respect, the core competencies intended to convey the idea that changes in technology and culture are leading to changing demands in the workplace and so the competencies that are required in todays and the future workplace are different from those required in the past (Autor, Levy, & Murnane; 2003; Levy & Murnane, 2004; cited in Patrick C., 2012)

OECD, 2016, infer these competencies as 'the right skills mix not only for the present but also for the future needs of dynamic labor markets and transferable, non-discipline specific skills as employee may achieve through learning that have application study, work and life contexts. This idea is also supported and (Gurvinder, 2008; cited in Sherer and Eadie, 1987), stated that core competencies skills are not job specific, but are skills which cut horizontally across all industries and vertically across all jobs from entry level to chief executive officer. Hence, these competencies are horizontally, and vertically cross cutting and they are different from academic qualification, certification and experience.

Moreover, core competencies or soft skills are taken as indicative if employee potential both in terms of job performance and career advancement and this may show their key role to improve organizational objectives as well as improvement of individual performer capacity. This means, these skills have a dual & sustainable individual and organizational effects. That is why, Joll et al., 2012, and Caballero and Walker, 2010 argued that these core competencies are a complex of generic attributes that allow employees to apply their technical knowledge to problem-identification and problem solving. This implies the futuristic and potential values of these competencies to employees' productivity.

In consolidating the above notion, several studies made on the issue asserted that the current job world is highly globalized, dynamic and full of uncertainty and several new jobs are either created or becomes obsolete, combined or splinted into various job types. Thus, since the current world of job has such features; competencies employees bring from their schooling may not serve them for long, unless the incumbent has empowered with the required core competencies.

These competencies are helpful for employees to communicate easily for result, to work in collaboration with others, to think critically and creatively to solve current & future anticipated problems and to get acquainted with technology for the successful accomplishment of jobs. When employees empowered with these competencies, they become lifelong learners who always strive to learn to climb the hill.

Nonetheless, a study made in Malaysia come with a finding that most of the employees possess excellent technical (core) or academic skills; while they are poor in mostly overlooked soft or core skills. These core competencies include communication, collaborative, creative, and critical thinking skills, among others. (Job Street, 2017). Similarly, to Scott, 2015; partnership for 21st century, 2014; Teh, 2010; kamarudin, 2015, the following are some of the skills and competencies

that workers of the core competencies need to acquire to be successful at the workplace. These are the ability to communicate effectively, think critically, solve problems, work collaboratively, engage in lifelong learning and innovate. A study made by Bermuda College; cited partnership for core competencies 2013, listed critical thinking, problem solving, communication, technical literacy, social & cross-cultural awareness and collaboration, among others as core competencies. (List of 21st century competencies)

Nevertheless, even though many of the contemporary literatures on the issue have supported the inclusion of 21st century skills to improve employees' performance; this conception is not free from critics. Opponents of this approach, such as (Silva, 2009) come with counter arguments against these 21st century competencies or skills. They leveled the term '21st century skills' as 'meaning less' and distraction from the more important work related or core competencies of employees. The major limitations, as to these scholars are, core competencies are related to measurement problems; being 'vague and confusing' of the term; and the multiple descriptors given to it, among others. The opponents concluded that ''emphasizing 21st century skills will water down standards…'' and they recommend the way out of this problem is the amalgamation or integration of skills and content than propagating solely for skills. This critic has not easily thrown away; because beyond wishing civil servants to possess with this core competencies, thinking over how we organize these skills, empower practitioners, deliver and assess trainings in such a way that promote these skills is essential. Despite their opposition these scholars have not undervalued the importance of these skills.

Unfortunately, no research (at least as to the knowledge of these researchers) had conducted in Ethiopia, on this specific issue yet; however, findings from previous research in Africa on employees' core competencies from the demand side have come with results. For example, in a study made in South Africa; Benson, Morgan and Fillipaios (2013); cited in P Jonck & F van der Walt (2015) argued that social skills and inherent personality traits are deemed as more important than technical skills or a degree qualification. As to this study, employees' core competencies contribute more than their qualification and experience. Based on this assertion, Asuquo and Inaja (2013); cited in (op cit. 2013) listed the following as the most important qualities that core competencies employees should possess: continuous learning, networking, teamwork, persistence, and organizational skills, among others.

Likewise, Freire, Alvares and Montez (2011); cited in P Jonck and F vander Walt (2015) also mentioned other most valued competencies needed for work performance in core competencies and these are communication, leadership, customer service, understanding, and emotional intelligence. Therefore, we can conclude from the arguments that most authors agree that competencies other than subject content knowledge mastery which certified by HEIs are essential for the core competencies.

Few research findings made on Ethiopian civil service organizations identified several challenges that faced the civil service. However, their major conclusion revolves around the systemic problem which results for ineffectiveness and inefficiency of the civil service. One among other frequently mentioned problem was 'low level of employee competence'. Nevertheless, it is a blanket conclusion that doesn't give clear answers for the type and magnitude of deficiencies our employees' lack. In other words, no explicit study had made on the status of employee's core competencies in Ethiopia. Consequently, an absence of research on core competencies may; either hinders us to know and fill the gap and make civil servants in Ethiopia ineffective and inefficient when compared with other countries civil servants in the time of globalization. However, following proclamation 1064/2021, the Ethiopian civil Services Commission has established a project office

and in collaboration with the Ethiopian Civil Service University, works hard to formulate a competency framework to civil servants.

The initiative, currently reached at the stage of identifying 11 core competencies that has believed to be important in the Ethiopian civil service sector. The identified 'core competencies' have resemblance as well as differences with other nation civil servants and other organizations core competencies. Following this the intention of the commission (as per the proclamation) is to introduce these core competencies to civil servants and check whether (both old and newly recruited civil servants) have acquainted with them during recruitment and thereafter through assessment.

However, besides identifying the 11 core competencies and made preparation to check the presence or absence of the skills in the employees and fill them consequently; employee's status towards these core competencies is not researched yet. Doing this may help the commission and capacity building agencies to know the status of employees towards these competencies and make the required effort to back up the drifts and consolidate those skills already possessed by employees.

In general, these competencies are helpful for employees to communicate easily for result, to work in collaboration with others, to think critically and creatively to solve current & future anticipated problems and to get acquainted with technology for the successful accomplishment of jobs. When employees empowered with these core competencies, they become lifelong learners who always strive to learn to climb the hill.

In this study, therefore the eleven core competencies identified by the FDRE, Civil Service Commission will be examined. The Ethiopian Civil Service Commission, Core competency package (ECSC, 2021) identifies 11 (eleven) core competencies that are clustered into three major groups. 'Good personality', consists of 3 subcategories: Emotional Intelligence, Commitment, and Customer Focused Service Delivery. The second cluster is named 'Cooperation and Coordination', which consists of 2 subdivisions; namely: Communication skill, Teamwork and Partnership. The third cluster is named 'Working to attain organizational objectives. It has five sub-components: Achieving result, Strategic thinking, Decision making, Entrepreneurship and reform, and Utilization of technology. The following research hypotheses guides this research study:

1. Employee commitment has a significant effect on employees' core competency development.
2. Organizational leaders' commitment has a significant effect on employees' core competencies.
3. The motivation level of the organization's goals has a significant effect on employees' core competency development.
4. The provision of training by organizations has a significant effect on employees' core competency development.
5. Clearly stated goals of the organization have a significant effect on employees' core competency development.
6. The clarity of organization standards has a significant effect on employees' core competency development.
7. The incentive system of the organization has a significant effect on employees' core competency development.

Objectives of the Study

The major objective of this study is to examine the status of core competencies of civil service employees of Ethiopia. The study will focus on achieving the following specific objectives.

1. Investigate the effect of employee commitment on the development of core competencies within the organization.
2. Examine how organizational leaders' commitment influences employees' core competencies.
3. Critically assess the effect of the motivation level of the organization's goals on employees' core competency development.
4. Analyze the effect of training provided by organizations on employees' core competency development.
5. Investigate how clearly stated goals of the organization affect employees' core competency development.
6. Examine how the clarity of organization standards influences employees' core competency development.
7. Assess the effect of the organization's incentive system on employees' core competency development.

Literature Review

Theoretical review of Related Literature

Competencies have a major role in augmenting integrated approach to Human Resource Management (HRM) to enable individuals to achieve desired proficiency within the organization. Investigation of effectual competencies usage can substantiate and reinforce many reforms being initiated among civil services. Sharma (2012) had suggested that the modern HR concepts, systems and practices have transformed into a different realm from the past. He further stated that there is a need to look at the competencies to provide organizations with a strategic competitive advantage. Inside civil services, literature proves move to competency-oriented epoch in HR management especially in performance appraisal. Strategic advantage for civil service is always there in terms of performance on their assigned role for the benefit of citizens and governments. Therefore, competencies have become main precept of job profiles to nurture and manage performance of civil services. Butler & Fleming (2002) have analyzed competency framework in Ireland and suggested that efficacy of competencies gets optimized through synergy and combination of competency-based PA approaches with various HRM functions like employee resourcing and progress.

Recognition, applicability and use of such framework in performance appraisal comprehensively promote a wide range of HR practices for productivity. This paper aims to explore literature and inputs from the officers about an effective use of competencies for Indian. Administrative Service (IAS) officers. Here the competency-based electronic performance appraisal approach is associated with accrued advantages to government, society and civil servants.

Concepts and meanings of core competencies

Competency is defined as a behavioral trait related to a particular body of knowledge and skills for effective job performance (Vathanophas & Thai-ngam, 2006). A competency is a cluster of observables, measurable, and highly interrelated attributes, including knowledge, skills, and abilities (KSAs) that give rise to the behaviors needed to perform a given job effectively to contribute to organizational success. Competencies can be technical or behavioral. Technical competencies reflect the knowledge required to perform a specific role. Behavioral competencies describe the KSAs that facilitate the application of technical knowledge to job-related behavior. In other words, technical competencies reflect the knowledge that HR professionals apply to their

jobs while behavioral competencies reflect on how they apply this knowledge (Dasho Karma Tshiteem, 2019).

Importance of core competencies to Civil Servants

For a long time, the competency concept has been around in public administration as shown by Hood and Lodge (2004). Until, say the mid-1950s, the term 'competency' was however exclusively understood as technical competency, that is, the 'subject expertise and technical skills' of individual civil servants (Hood and Lodge 2004, 781). It was not only nineteenth century Germany in which technical competency was deemed necessary to run government bureaucracy more efficiently as stated by Hood and Lodge (2004), but also, among others, the Chinese emperors (Bowman 1989), the Roman administrators (Jones 1949), and the Ottoman sultans (Quataert 2005) used technical competency as criterion for recruiting, selecting, and promoting civil servants.

From the 1950s onwards, Hood and Lodge (2004) identified at least three different meanings of the competency concept which, although developed in the business world, were sooner or later incorporated in the field of public administration (cf. Horton, 2002). First, competencies can be seen as 'behavioral traits associated with excellence' (Hood and Lodge 2004, 781). The origin of this meaning can be traced back to the work of McClelland (1973). McClelland argued that the Western education system had to be less preoccupied with assessing (and training) intellectual capacities but had to focus more on assessing (and training) key traits that students need in real life, that is, their actual work.

It was later added to McClelland's school of thought by Boyatzis (1982) that these key traits – competencies – had to be understood as traits that differentiate excellent from average performers (cf. Boyatzis 2008). Applications of this approach in public administration can be found for example in Gertha-Taylor (2008) who tried to identify critical collaborative skills for civil servants, which were defined as'… *differentiating competencies*, or those competencies that distinguish superior performers from average performers' (2008, 105, emphasis in original).

In the 1980s, the competency concept was also introduced in the strategic management literature (Prahalad and Hamel 1990). In this field, the term was 'transposed' from the individual level to the level of the organization (Hood and Lodge 2004). It is believed that organizations need to identify those capacities that they consider their main assets which, moreover, cannot be easily copied by other organizations. If nurtured correctly, these key capacities – dubbed 'core competencies' – were believed to result in a strong competitive advantage. Proponents of the 'core competency school of thought' encourage organizations to strengthen their core competencies further to remain ahead of the competitors. Originally, the literature on core competencies focused on private-sector organizations, but various authors tried to apply this line of thinking to public organizations too (e.g. Moore 1995).

In the 1980s, a humbler meaning of the competency concept was (re-)introduced. Instead of exclusively considering competencies as those abilities that distinguish excellent from average performers, competencies were in this stream of research defined as 'minimum abilities required to tackle specified jobs' (Hood and Lodge 2004, 781). Various public administration scholars, often implicitly, follow this humble meaning of the competency concept too. For example, Kruyen and Van Genugten (2017) investigated to what degree civil servants need to be creative in their work without assuming that excellent civil servants are by definition creative employees. In this article too, we follow the humbler meaning of the competency concept. Specifically, we define competencies broadly as work-related skills, abilities, and attitudes that civil servants need to apply to perform their job effectively (cf. Hirsh and Stable, 1995 in Horton 2002, 4). In this study, we

aim to explore which competencies civil servants themselves consider important to enhance task performance.

Challenges for equipping the core competencies

Many of today's organizations can be characterized as distributed, matrix, and global, with functions that often operate autonomously in the absence of governance. These factors make efficient and effective identification, utilization, and implementation of competencies difficult. In fact, 69 percent of organizations surveyed said their competency management was only somewhat, or not at all, effective. Interviews and focus groups with executives and other business and HR leaders exposed six competency challenges prevalent in many organizations. It is believed that Competency management is treated as an HR process, rather than a business imperative.

On average, 88 percent of organizations identified better leader and employee performance as important or critical to the business. When asked about the single most important call to action to improve performance, interviewees said, "Tell employees what is expected of them to excel." Performance excellence, then, means clear communication of the competencies for which an employee is accountable. But in our *2015 State of Leadership Development Study,* 31 percent of organizations said they had not defined their critical leader competencies, much less any of the others (core, functional, or career). Until competency management is revered as the business imperative it is, performance will continue to languish.

Without an assessment strategy (15 percent) and the ability to predict the skills needed by the business going forward, organizations are left clueless as to what skills exist and are needed. Some 74 percent of organizations say that definition of essential competencies by talent segment and job role is critical, or important, to the business. Yet, a stark .7 percent of organizations have the means to predict the essential skills required.

Some 61 percent of organizations have only somewhat effectively, or not at all, identified critical talent segments and key job roles. Hence, it goes without saying that most have yet to define critical job responsibilities and success criteria. In the absence of these competency procedures, it is no surprise that 72 percent of organizations indicate that employee and leader skill building is only somewhat, or not at all, focused on developing competencies requisite for achieving business goals.For the first time ever, an organization's people strategy supersedes the organization's business strategy, in regard to its importance in meeting business goals.

Empirical Review of Related Literature

According to research by Kim and Jung (2022), human resource professionals should situationally match company culture and personnel competency to lower employee stress. The authors suggest that firms should cultivate a clan organizational culture if they wish their staff to possess adaptation competencies (a professional competency). Organizations, on the other hand, should promote a market organizational culture for their personnel who have a proficiency in consumer orientation (simply a result-oriented ability). The study's findings add to the body of literature, deepen academics' grasp of the subject matter, and provide a significant knowledge base for upcoming empirical studies. In addition, the study conducted by Keerthy and Biyu (2018) showed that improving work competence can significantly improve employee performance.

The assessment of employees' core competency skills in the public sector is a fundamental step in understanding the current skill levels of the workforce, identifying strengths and areas for improvement, and designing targeted training programs to enhance employee performance and organizational effectiveness. This process plays a crucial role in ensuring that employees have the necessary competencies to meet the demands of their roles and contribute positively to the achievement of organizational goals (Alemu & Mekonnen, 2020).

Ethiopian public sector professionals face both opportunities and problems in improving core competency abilities, according to research by Tadesse et al. (2019). Opportunities include focused training programs and performance management initiatives, whereas difficulties include organizational culture, leadership support, and resource limitations.

Girma and Abebe (2018) posit that a multitude of factors impact Ethiopian public sector personnel' acquisition of core competency skills. These elements consist of systems for performance management, job design, employee motivation, and organizational policies. To create an atmosphere that is favorable for skill development, these variables must be addressed.

Training programs are important in helping public sector professionals improve their core competency skills, as Abate et al. (2021) mentioned. Employees participating in effective training programs might gain new skills, perform better, and advance company objectives. Putting money into focused training initiatives is essential to developing a competent workforce in the public sector.

One of the most important steps in determining the workforce's strengths and opportunities for development is evaluating the core competence skills of employees in the public sector. Alemu and Mekonnen (2020) stress the significance of this evaluation since it gives businesses insightful information about the skill levels of their workforce, allowing them to create customized training plans that cater to needs.

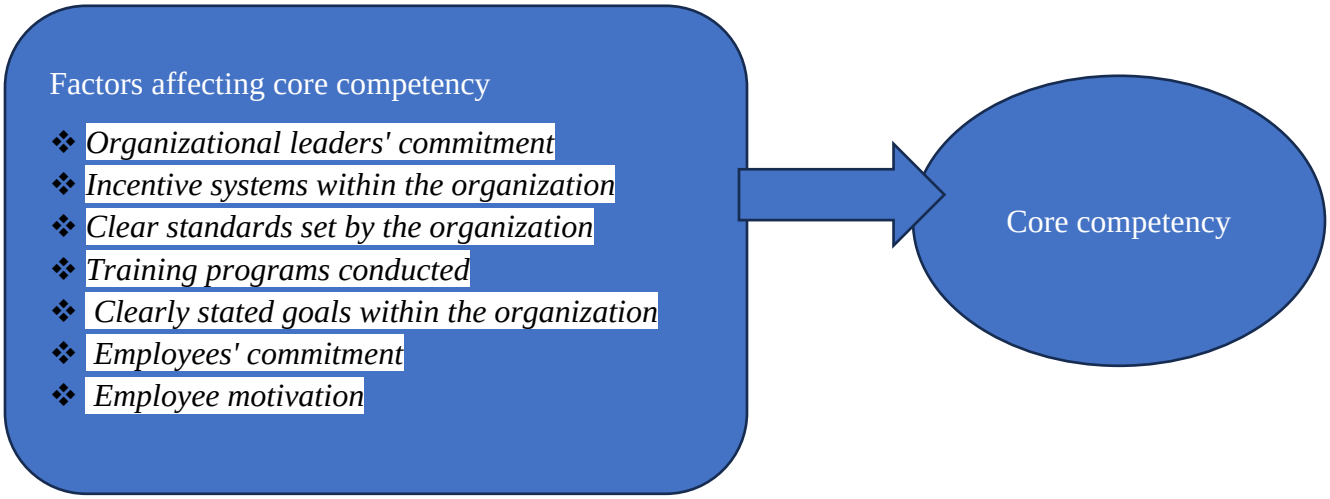
Organizations can obtain a full grasp of the talents and abilities of their personnel by carrying out an extensive evaluation of core competence skills. Employees' knowledge, skills, talents, and behaviors pertinent to their employment tasks and obligations in the public sector are assessed as part of this evaluation. Effective competence assessment, according to research by Gao, Janssen, and Johnston (2017), aids organizations in identifying the skills shortages in the workforce so that training programs can be customized to close these gaps and improve overall performance.

Organizations can determine an employee's strengths and weaknesses in core competency abilities by using this evaluation technique. Organizations can use individuals' strengths by knowing them and assigning projects that complement their areas of competence. However, by pinpointing areas that need work, organizations may create customized training plans that close certain skill gaps and improve productivity. The significance of ongoing competency assessments in the public sector is underscored by research conducted by Farazmand (2018), which guarantees that staff members can adjust to evolving work specifications and organizational demands.

Additionally, organizations can better connect their training and development programs with strategic goals and objectives by evaluating employees' core competence skills. Organizations may guarantee that employees learn the skills and abilities needed to fulfill organizational goals and effectively contribute to achieving targeted outcomes by customizing training programs based on assessment results. O'Toole and Meier's (2017) study found that when training programs are in line with organizational objectives, employee motivation and engagement rise, which enhances output and job satisfaction.

Conceptual Framework of the Study

The independent variables which include leadership commitment, incentive structures, clearly defined standards, training program conducted, articulated goals, employee commitment, and motivation whereas the status of competency is dependent variable**.**



Source: The researchers own source from various literature (June 2022)

Methodology

Research Design and Approach

The research utilized a combination of descriptive survey and explanatory research design. Descriptive design was selected to collect data from a wide population using questionnaires. Meanwhile, explanatory design was employed to investigate the impact of various factors on the competency performance of employees in the sampled organizations. The study followed a mixed research approach, specifically employing a concurrent explanatory research design. Both primary and secondary data sources were utilized to gather the necessary information to meet the research objectives. The respondents of the study included public service employees who held at least a first-degree qualification. In addition to quantitative data, qualitative data was also obtained through focus group discussions to substantiate the quantitative with qualitative.

Target Population, Sample Size and Sampling techniques

The study primarily focused on the Civil Service Organization of Ethiopia, specifically emphasizing the permanent government employees at bureaus and respective offices operating at various levels. Ethiopia comprises nine regional states (Oromia, Amhara, Tigray, SNNP, Harari, Benishangul, Gambella, Somali, and Afar), along with two city administrations (Addis Ababa and Dire Dewa). The regional states are categorized as either developed or emerging. The well-developed states include Oromia, Amhara, Tigray, SNNP, and Harari, while Benishangul, Gambella, Somali, and Afar are considered emerging regions. Tigray and Afar regions were in political instability and hence did not include in the study.

To get a sample, the study employed purposive sampling techniques in which the highest employees staffed region such as two developed regions (Oromia and Amhara) were selected. From the emerging region (Jijiga) and from the administrative cities of Addis Ababa city administration were selected. The sample sizes for each regional state and city administration were determined using the maximum sample size needed for a particular population size and margin of error is provided by the Kerche and Morgan table. It is a statistical tool used in survey research to

calculate the smallest sample size required to estimate population parameters with the appropriate degree of precision. The table indicates that the largest population's maximum sample size is 384, with a 95% margin of error. Because there are many employes in the regional state government bureaus, 384 samples from each region were considered, for a total of 1536 samples from the four regions.

There were twenty bureaus in each of the chosen regional states and city administrations. Using a lottery, a 20% sample was selected from these bureaus. According to Gay and Diehl (1992) as referenced in Hill (1998), a sample size of 10% or above is deemed sufficient for survey research. Out of the 20 bureaus, five bureaus (the Revenue Bureau, Public Service and Human Resource Development, Finance, Trade and Industry, and Construction bureaus) were chosen through a lottery method from a total of 20 buraus. Furthermore, proportionate stratified and systematic random sampling techniques were used to choose a sample of respondents from each bureau. Additionally, a purposeful sample strategy was used to carefully choose members for the focus group discussions.

Data collection Methods

The study utilized both questionnaire and focus groups discussion tools to gather information from the sampled population. The purpose of the questionnaire was to collect comprehensive data while maintaining objectivity. There were both open-ended and closed-ended items in it. To get more detailed insights, focus group discussions were also held. Pilot testing was done before the primary data collection to find any difficult or ambiguous items. Pilot test results included ambiguous statements in the questionnaire and improperly worded instructions that caused respondents to make mistakes. Before the questionnaire's final distribution, these issues were fixed. The Cronbach's alpha reliability test was used to assess the internal consistency of the items, and all the items were found reliable. Moreover, experts in the field reviewed the items to evaluate their face validity.

Data Analysis Methods

The collected quantitative data was analyzed using descriptive statistics techniques, such as percentages and weighted mean. Additionally, ANOVA was employed to investigate if there were significant differences among regions regarding factors influencing employees' core competency. Multiple regression analysis was also conducted to examine the effects of core competency determinants on employees' core competency. Prior to applying multiple regressions, assumptions including linearity, normality, multicollinearity, and heteroscedasticity were examined.

Conversely, the qualitative data collected from focus group discussion underwent analysis through sorting, classifying, and arranging, with a particular emphasis on combining thematic content analysis methods. The results derived from the quantitative data were presented visually using tables, graphs, charts, and percentages. Furthermore, the qualitative data served as a supportive component that provided additional evidence and substantiated the findings obtained from the quantitative analysis.

Results and Discussions

Before going through the analysis, the researchers compute the reliability test for each construct and the results for all are above the expected cut point (0.7) as seen in table 1 below.

Table 1 Reliability test

	Reliability Statistics	
Constructs	Cronbach's Alpha	N of Items
Customer focus	0.911	8
Communication	0. .868	6
Teamwork	0. .913	7
Achievement	0.909	5
Decision making	0.909	5
Utilization of technology	0.898	6
Factors Affecting Core Competency	0.913	8

Source: survey data (2023)

Descriptive analysis of core competencies of employees

The data collected from 1269 respondents on dimensions of core competencies of employees (customer focus, communication, teamwork, goal achievement, and decision-making) and factors affecting core competencies of employees were processed, analyzed, and discussed below by using Pihie and Akmaliah's (2009) mean cutting point to analyze the data. A mean score below 3.39 is deemed low; those between 3.40 and 3.79 are considered moderate, and those above 3.79 are considered high.

Table 2 Perception of respondents on customer focus competency

SN	Items	N	Mean	Std.
1	Your organization consider the customer's need in planning activities (CU1)	1269	3.48	1.169
2	Your organization set standards based on the needs of customers interests (CU2)	1269	3.54	1.137
3	Your organization perform its all activities based on interests of customers (CU3)	1269	3.36	1.198
4	Your organization use feedback from customers to improve its customer service delivery (CU4)	1269	3.42	1.197
5	Your organization provide service by taking concerns of their customers' needs seriously (CU5)	1269	3.44	1.15
6	Your organization is responsive for customers 'needs (CU6)	1269	3.53	1.169
7	Your organization provide tangible services which is related to customers' expectations (CU7)	1269	3.51	1.13
8	Your organization use proper complaint handling mechanism (CU8)	1269	3.47	1.139
	Cumulative mean		3.48	1.161

Source: Survey data (2023)

As a result, respondents in table 4.1 above rated moderate (M= 3.48, Std=1.169) as their organization considers customer needs in planning. Besides, respondents replied moderate, as their organization sets standards based on the needs of customers' interests, as evidenced by M = 3.54 and Std = 1. 137.Respondents also perceived low as their organization performed all activities based on the interests of customers, as exhibited by M = 3.36 and Std = 1.198. Employees replied moderately (M = 3.42, Std = 1.197) as the organization uses feedback from customers to improve its customer service delivery. Respondents replied moderately (M = 3.44, Std = 1.150) as their organization provides service by taking concerns about their customers' needs seriously.

Respondents in the same table above rated moderate because their organization is responsive to customer needs, as evidenced by a mean of 3.53 and a standard deviation of 1.169. In addition, respondents replied moderately that the organization provides tangible services that are related to customers' expectations, which are exhibited by a mean of 3.51 and Std. 1.130. Moreover,

respondents rated moderate as organizations use proper complaint handling mechanisms, as evidenced by the mean of 3.47 and Std. of 1.139. The cumulative mean generally indicates that the selected organizations are customer focused to some extent.

Communication

Table 3 Respondent's perception on communication competency

SN	Items	N	Mean	Std.
1	Employees of the organization can communicate their ideas in writing	1269	3.51	1.161
2	Employees of the organization can communicate their ideas orally	1269	3.59	1.102
3	Employees of the organization can listen and comprehend ideas	1269	3.65	1.054
4	Employees of the organization can Maintains direct contact with customers	1269	3.51	1.167
5	Employees of the organization can report information to supervisors and colleagues	1269	3.72	1.074
6	Employees of the organization can discuss with customers using arguments to exchange ideas.	1269	3.58	1.102
	Cumulative mean		3.59	

Source: Survey data (2023)

As indicated in Table 4.2, respondents had moderate ratings for the statement "Employees of the organization are able to communicate their ideas in writing (M = 3.51; Std = 1.161). This implies that employees are communicating their thoughts in writing slightly. Besides, respondents had replied moderately, as employees of the organization are able to communicate their ideas orally, as evidenced by the mean of 3.51 and Std 1.161. Employees' ability to listen and comprehend ideas was rated moderately by respondents, with a mean of 3.65 and a standard deviation of 1.054which implies that employees can listen and comprehend ideas to some extent.

Respondents also have moderate ratings on employees' ability to maintain direct contact with customers, as supported by mean ratings of 3.51 and 1.167. In addition, respondents perceived as employees of the organization can report information to supervisors and colleagues in a moderate (M = 3.72, Std = 1.074) way. Furthermore, respondents had a moderate rating (M = 3.58, Std = 1.02) on employees' ability to discuss with customers by using arguments to exchange ideas. In general, the cumulative mean indicates that employees communicate with one another only slightly.

Teamwork

Table 4 perceptions of employees on teamwork competency

SN	Items	N	Mean	Std.
1	Employees Share information openly among team members	1269	3.64	1.130
2	Employees participate in the development of team goals	1269	3.64	1.077
3	Employees Co-operates with team members to resolve problems.	1269	3.56	1.123
4	Employees are willing to take time to provide help to other members.	1269	3.55	1.062
5	Employees seek help from others in performing their activities	1269	3.57	1.094
6	Employees acknowledge other's skills, experience, knowledge, creativity and contributions.	1269	3.51	1.100
7	Team members address conflicts within the group.	1269	3.37	1.135
	Cumulative Mean		3.55	

Source: Survey data (2023)

Respondents rated moderately, as evidenced by mean ratings of 3.64 and 1.130 on employees sharing information among team members, as shown in Table 4.4.4. This reveals that employees share information openly with team members to some extent. Additionally, respondents are seen as employees who participate moderately (M = 3.64, Std = 1.077) to develop team goals. In addition, respondents had a moderate rating for the statement that employees cooperate with team members to resolve problems, as evidenced by a mean of 3.56 and a standard deviation of 1.

123.This point sticks out as employees cooperate with team members to resolve problems somewhat. On the same table above, respondents gave a moderate rating (M = 3.55 and Std. = 1.062) to employees' willingness to take time to provide help to other members. Besides, respondents replied moderately (M = 3.57, Std = 1.094) on employee's need for help from others in performing their activities. This shows that employees seek slight help from others to accomplish their activities. Respondents also rated moderately on employees' acknowledgment of others' skills, experience,

Knowledge, creativity, and contributions, as evidenced by a mean of 3.57 and Std of 1.100. On the other hand, employees rated low (M = 3.37, Std = 1.135) for the statement 'Team members address conflicts within the group'. Moreover, the cumulative mean (M=3.55) revealed that employees have a moderate capability to engage in teamwork.

Achievement results

Table 5 Perceptions of employees on Achievement of goals

Achievement Items	**N**	**Mean**	**Std**
Employees are committed to perform work	1253	3.65	1.075
Employees accomplish tasks on time	1252	3.49	1.113
Employees measure their performance and check against with the organizational goals	1238	3.48	1.096
Employees measure their performance and check against with the organizational goals.	1244	3.44	1.132
Employees work by linking their daily activities with organizational goals	1235	3.40	1.128
Average Mean & Std.		3.49	1.1088

Source: Survey data (2023)

As a result, respondents in table 4.4 rated moderate (AM= 3.49, ASTD=1.1088) as their organization employees are committed to perform their work, accomplish their work on time, working to satisfy customers' need, and measure their performance and check against with the organizational goals towards organizational result achievement. This depicted that employees of the organization are not able to contribute their part towards organizational result achievement as expected. Moreover, the cumulative mean (M=3.49) revealed that employees have a moderate capability to contribute their part in the organizational achievement of result.

Table 6 Decision making

Decision Making items	**N**	**Mean**	**Std.**
Employees take adequate alternatives to make decisions.	1248	3.27	1.095
Employees can make decisions with reasonable time.	1253	3.37	1.093
Employees take risks to make decisions that may yield significant results.	1247	3.33	1.108
Employees make effective decisions autonomously	1249	3.28	1.107
Employees make proactive decisions	1247	3.34	1.139
Average Mean		3.31	1.1084

Source: survey data (2023)

As a result, respondents in table 4.5 rated low (AM= 3.31, ASTD=1.1084) as employees in their organization made decision by take adequate alternatives to make decisions, can make decisions with reasonable time, take risks to make decisions that may yield significant results, makes effective decisions autonomously and proactive decisions. Moreover, the cumulative mean (AM=3.31) revealed that employees have a low capability to decide in their day-to-day activities in the organization.

Table 7 Utilization of Technology

SN	Item	N	Mean	Std.
1	Employees have required skills of ICT for their assigned job.	1249	3.52	1.155
2	Employees have an ability to communicate ideas with the help of ICT	1250	3.55	1.109
3	Employees have positive attitude towards the use of technology.	1247	3.70	1.045
4	Employees use ICT to collect, store and retrieve information from the wider world of knowledge.	1251	3.54	1.103
5	Employees analyze various data and solve problems consistently with the help of ICT	1239	3.47	1.115
	Average mean &Std		**3.55**	**1.1054**

Source: survey data (2023)

As a result, respondents in table 4.4.6 rated moderate (AM= 3.35, ASTD=1.1054) as employees in their organization use technology for their job, to communicate with other others, to collect and sore information. Moreover, the cumulative mean (M=3.55) revealed that employees have a moderate usage of technology while performing their activities in the organization.

Table 8 Factors affecting employees core competency Development

SN	Items	N	Mean	Std.
1	Organizational leaders are committed in promoting employee's technical skill	1248	3.13	1.226
2	Your organization has incentive systems to promote employees core competency	1251	3.19	1.240
3	Your organization has clear standards to evaluate employee's competency	1252	3.22	1.179
4	Your organization conducts trainings to fill competency gaps of employees	1249	3.23	1.184
5	Your organization clearly stated goals to enhance the skill of employees	1253	3.23	1.151
6	Employees are committed to develop their competency.	1251	3.37	1.116
7	Employees are motivated by the goal of the organization	1254	3.37	1.151
	Mean		3.25	

Source: survey data (2023)

The determinants of employees' core competencies development in their individual firms were asked to be rated by the respondents. As shown in Table 4.7, employees were rated low on commitment of top-level managers (3.13), incentive systems to promote employees core competency (3.19), developing standards to evaluate employee's competency (3.22), providing training to fill competency gaps (3.23), clearly defined competency development goals (3.23), employee commitment to develop their competency (3.37), and employee motivated by organizational goals (3.37). The overall mean of the determinants of employees' core competency development (3.25) in their respective organizations revealed that the practice was found low. This implies that employees of the organizations were not satisfied with their organization initiative to develop employees' core competency. This consequently results with lack of employees required skills to serve their respective organizational customers.

Regression analysis

In addition to the descriptive analysis researchers had conducted an inferential analysis to evaluate the extent of influences of each factor on employees' core competency by using regression analysis. Before regression analysis all necessary assumptions for regression analysis (linearity, normality, multicollinearity, and Heteroskedasticity) were assured by the researchers.

Table 9 Test of model fitness (ANOVA Test)

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	434.535	7	62.076	269.068	.000[b]
Residual	281.234	1219	0.231		
Total	715.769	1226			

Source: survey data (2023)

The significance level for the ANOVA test results was less than 0.05, as shown in Table 4.8. Therefore, it can be said that the model is appropriate for additional regression analysis.

Table 10 R-square results

R	R Square	Adjusted R Square	Std. Error of the Estimate
.779[a]	0.607	0.605	0.480

The combined impacts of the predictor variables were responsible for 60.7% of the changes in the dependent variable. However, other variables were not examined in the study account for 39.3% of the variances.

Table 11 Hypothesis testing 10000 67754194

Formulated Hypothesis	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	Beta	Std. Error	Beta		
Employee commitment has a significant effect on employees' core competency development.	0.206	0.017	0.302	12.35	000
Organizational leaders' commitment has a significant effect on employees' core competencies.	0.133	0.018	0.214	7.45	000
The motivation level of the organization's goals has a significant effect on employees' core competency development.	0.109	0.017	0.164	6.42	000
The provision of training by organizations has a significant effect on employees' core competency development.	0.09	0.019	0.139	4.74	000
Clearly stated goals of the organization have a significant effect on employees' core competency development.	0.084	0.02	0.127	4.28	000
The clarity of organization standards has a significant effect on employees' core competency development.	0.026	0.019	0.039	1.32	0.19
The incentive system of the organization has a significant effect on employees' core competency development.	-0.012	0.015	-0.02	-0.79	0.43
(Constant)	1.417	0.051		28	000

Source: survey data (2023)

The developed hypotheses are shown in Table 4.10 together with their unstandardized and standard coefficients, T-value outcomes, and level of significance difference. The variance of the dependent variable, which is governed by all other variables in the model, is best explained by the variable with the highest beta value. The beta column below the standard coefficient illustrates this. The most important variables influencing the development of employees' core competencies in the study area were employee commitment (0.302), organizational leaders' commitment (0.214), and motivation for the organization's goals (0.164), organization-provided training (0.139), and clearly stated organizational goals (0.127).

Discussions

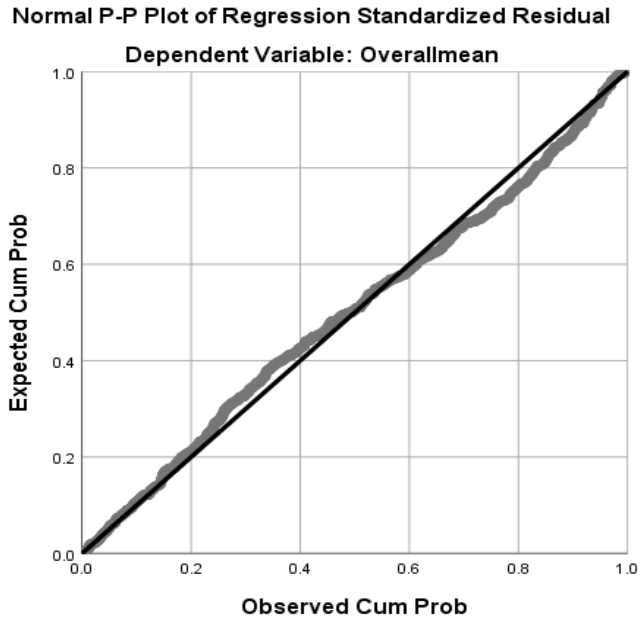
The study shows that the sampled organizations are strived to develop their plan based on their customers' needs and set standards by considering their customers' interests to some extent. Organizations are responsive to their customers to some extent but underperform in providing tangible services related to customers' expectations even if there is a proper compliant handling mechanism. Thus, the selected organizations are customer focused to some extent. In addition, the qualitative data also support the quantitative results as there is a gap in fully considering their customer needs and expectations in all stage of organizational activities like in planning.

As far as communication competency of employees is concerned, the study found out that employees are communicating their thoughts and ideas in writing and orally slightly. Employees have moderate communication competency which helps them maintain direct contact with customers and they are moderately able to report information to their supervisors. Besides, there is a slight discussion with customers based on arguments to exchange ideas. This study is related to the findings of Puteh et al. (2016) which revealed that there are four critical competencies that are required by employees, namely functional competency, communication competency, leadership competency and cognitive competency.

Regarding teamwork, the study also revealed out that employees can share information openly with team members, cooperate to each other in resolving problems to some extent, slightly acknowledging their coworkers' competency and slightly participate in the development of team goals even though some of the team members are not able to address conflicts in groups as expected. Employees of the organization are not able to contribute their part towards organizational result achievement as expected. Moreover, the qualitative data from open-ended questions and focus group discussion support the quantitative data by stating that there is better participation of team members in different activities of the organization even though all members are not equally participated as expected. The finding is evidenced by Kawshala (2017) which shows that core competencies reflect the collective learning of an organization and involve coordinating diverse production skills and integrating multiple streams of technologies which includes communication, involvement, and a deep commitment to working across organizational boundaries, improving cross-functional teams within an organization to address boundaries and to overcome them.

In addition, study found out that there is moderate capability of employees to contribute their part in the achievement of organizational goals even if employees are not able to make decision in reasonable time, take risks and yield significant result as much as needed. Besides, employees have a low capability to decide in their day-to-day activities in the organization and they use technology for their job, to communicate with other others, to collect and sore information. Moreover, the study revealed that employees of the organizations were not satisfied with their organization initiative to develop employees' core competency which consequently results with lack of employees required skills to serve their respective organizational customers. Response from focus group discussion contradict that most of employees can use the available technology but there is a limitation of technological infrastructure that encourage employees to use technology in their day-to-day activities. The finding is indirectly related to study conducted by Danneels (2002) which suggest that use of technology had facilitate and improve competencies as a driving force for firm renewal and product innovation. From factors that influencing the development of employees' core competencies identified in the study area were employee commitment, organizational leaders' commitment, and motivation for the organization's goals, organization-provided training, and clearly stated organizational goals.

Figure Test of Linearity



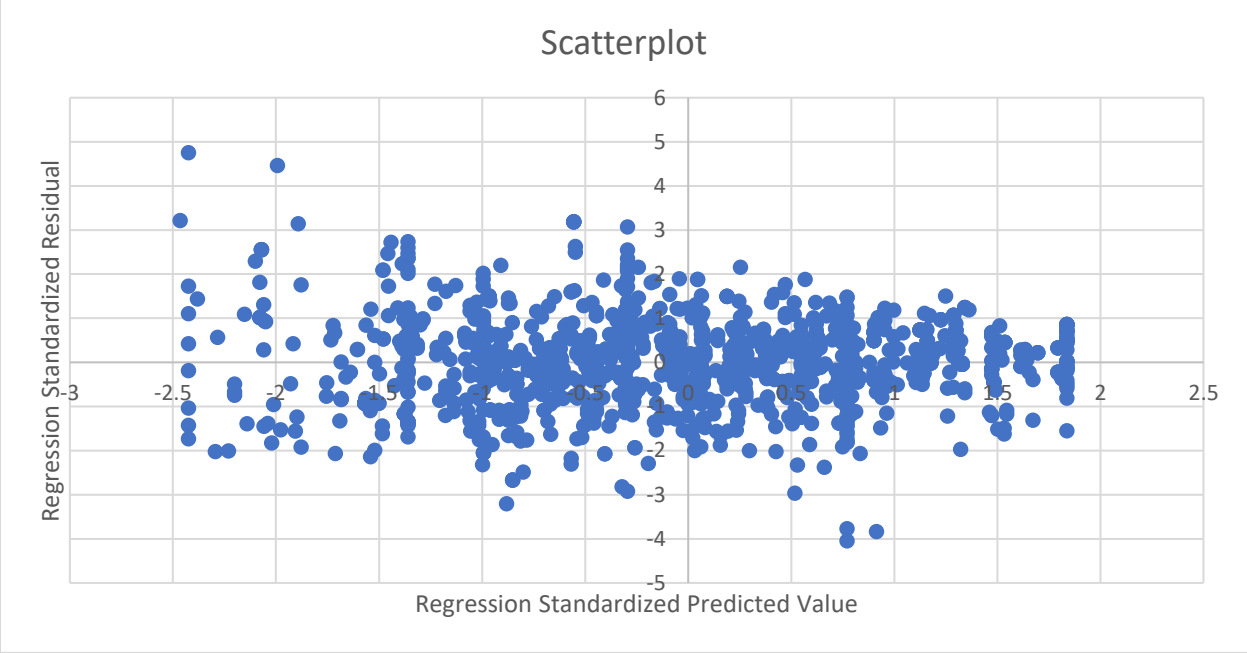
Linearity is one of the presumptions underlying linear regression. A Normal P-P plot was utilized to test this. A similar test is employed to examine the residuals' normal distribution. A graphical method for determining whether a data set is roughly normally distributed is the normal probability plot. The points in the data are displayed against a hypothetical normal distribution such that they should roughly form a straight line. Deviations from the straight line signify a change from the norm. As Figure 1 demonstrated, the plot showed both linearity and normality.

Table 12 Test of Multicollinearity

	Collinearity Test	
Determinant Factors of Employees Core Competency	Tolerance	VIF
Organizational leaders are committed in promoting employee's technical skill	0.392	2.554
Your organization clearly stated goals to enhance the skill of employees	0.366	2.734
Your organization conducts trainings to fill competency gaps of employees	0.375	2.669
Your organization has clear standards to evaluate employee's competency	0.362	2.760
Your organization has incentive systems to promote employees core competency	0.513	1.949
Employees are committed to develop their competency.	0.540	1.852
Employees are motivated by the goal of the organization	0.492	2.033

According to Table 4.8's multicollinearity test, all the VIF column values are less than 10 and all the tolerance values are larger than 10%, respectively, proving that the explanatory variables are not affected by multicollinearity. The null hypothesis, which states that there is collinearity among the independent variables, is thus disproved.

Figure 2 Test of Heteroskedasticity



It can be argued that the regression model does not have a heteroscedasticity issue. As shown in Figure 4.2, the scatter plot output seems to indicate that the spots are diffused and do not create a distinct, recognizable pattern.

Table 13 Test of model fitness (ANOVA Test)

	Sum of Squares	df	Mean Square	F	Sig.
Regression	434.535	7	62.076	269.068	.000[b]
Residual	281.234	1219	0.231		
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The significance level for the ANOVA test results was less than 0.05, as shown in Table 4.8. Therefore, it can be said that the model is appropriate for additional regression analysis.

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Table 15 Hypothesis testing

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The developed hypotheses are shown in Table 4.10 together with their unstandardized and standard coefficients, T-value outcomes, and level of significance difference. The variance of the dependent variable, which is governed by all other variables in the model, is best explained by the variable with the highest beta value. The beta column below the standard coefficient illustrates this. The most important variables influencing the development of employees' core competencies in the study area were employee commitment (0.302), organizational leaders' commitment (0.214), and motivation for the organization's goals (0.164), organization-provided training (0.139), and clearly stated organizational goals (0.127).

Conclusions and Recommendations

Conclusions

The research focuses on five aspects of core competencies (customer-focused, communication, teamwork, goal achievement, and decision-making) and the variables influencing those competencies to evaluate and assess the core competencies of employees. The research concludes that, despite employees' moderate customer focus and communication with coworkers, there is a gap in their fundamental competencies. Additionally, the research finds that some employees, despite not being as expected, are better at teamwork.

The employees' status in achieving result, decision making and usage of technology to promote the status of their core competencies elements is not up to the standard of modern Era which enables employees competent enough in their organization.

The organizational leaders' commitment to promoting employees' technical skills, organizational incentive systems to promote employees' core competencies, and clear standards for organizations to evaluate employees' competencies were the first three low-rated factors that the respondents identified in the development of employees' core competencies.

The most important variables influencing the development of employees' core competencies in the Ethiopian Civil Service organizations were employees' and organizational leaders' commitment, employees' level of motivation for the organization's goal, the organization's provision of training, and the organization's clearly stated goals.

Recommendations

- It is recommended that Ethiopian civil service organizations increase employee engagement, inspire workers, and offer pertinent training to close employees' skill gaps.
- Organizations better to set standards to assess staff proficiency and explicitly articulate their goals for competency development.
- To help people build their core abilities, top-level managers need to commit to doing so.
- The development of an incentive program that supports the promotion of employees' core competencies is advocated for organizations.
- The commitment of both employees and organizational leaders, the development of the organization's goals with clarity to drive employees, and the provision of suitable training are all important characteristics organizations need to try to improve.

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3.7. The Effect of organizational trust on service quality in the public sector: Do participatory decision making and employees' engagement play a role?

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Abstract

The purpose of this study was to analyze the effect of organizational trust (OT) on service quality (SQ) via mediation of participatory decision making (PDM) and employees' engagement (EE) in the case of Addis Ababa Water and Sewerage Authority (AAWSA). Explanatory research design with mixed methods approach was used. Quantitative data were collected from leaders, employees and customers of AAWSA, whereas qualitative data were collected via interview with leaders. Data analysis was done using mean standard deviations and structural equation modeling. Findings revealed that at AAWSA, OT, PDM and EE have moderate levels whereas EE is high. Besides, the direct effects of OT on SQ and EE are of medium size and statistically significant. However, its direct effect on PDM is small and statistically insignificant. OT's indirect effects on SQ via mediations of EE and PDM are also statistically insignificant. Having high level of EE, AAWSA's SQ is of moderate level. Thus, unless AAWSA rethinks the relationships among its OT, PDM, EE and SQ and stretches the potential of its engaged employees to the extent of providing innovative solutions, the city's residents and development projects will suffer from lack of quality water and sewer services soon.

Key words: *Organizational trust, Participatory decision making, Employees' engagement, Service quality, Water, Sewer*

Introduction

Prevalence of unprecedented changes in the internal and external environments of organizations forced management practitioners and scholars to search for organizational variables that make organizations resilient and successful in the faces of difficulties (Sinek, 2009; Beats, 2006). Since employees are the centrally unique assets of any organization, great attempt was made to identify personnel related variables that could contribute to enhanced performance (Simonsen, 1997; Henry, 1995). Among those factors, Job rotation, job enlargement, training and development, job enrichment, quality circles, pay, colleagues, supervisors, work and promotion opportunities are mostly considered by different researchers (Dereje, et al, 2020, Andrade, et al, 2017; Nda & Far, 2013). Besides, research has shown that employees like to have challenging jobs that increase their knowledge, skill and attitude towards the organization and the specific jobs they are engaged in (Westover, 2014; Morgeson & Humphrey, 2005).

Nonetheless, Introduction of organizational trust into management and organizational behavior literatures diverted the search for employee-based variables of organizational success from extrinsic factors to intrinsic ones (Sinek, 2009; Covey, 2006; Al Golin, 2004). It was found out that organizations characterized by high levels of trust among their members' experience benefits

such as strong friendships, freedom of expression, institutional loyalty, heightened self-esteem, open communication, information exchange, acceptance of innovation, good coordination, sense of belongingness, reduced supervision, inimitable competitive advantage, and unhindered development (Salah et al., 2022; Vanhala & Tzafrir, 2021; Rababah et al., 2019; Maxwell, 2011; Shockley-Zalabak, et. al, 2010).

In fact, trust per se does not directly result in enhanced performance. Rather, it paves a way for development of positive organizational attributes such as: motivation, participatory decision making and employees' engagement (Tracy, 2011; Sinek, 2009; Covey, 2006; Al Golin, 2004,). While this theoretical argument is sound in terms of creating intrinsic motivation in employees for higher performance, there is limited and fragmented empirical research that shows the mediating roles of participatory decision making, and employees' engagement on the relationship between organizational trust and service quality (Abera et. al, 2022; Abriham, 2021; Assefa, & Singh, 2020; Kumar & Saha, 2017; Jin & McDonald, 2016; Nidhi & Kumari, 2016; Ermias, 2014).

Therefore, the purpose of this research is to bridge this gap by proposing that organizational trust (OT) ensures service quality (SQ) by setting the stage for participatory decision making (PDM) and employees' engagement (EE).

The study context

Just like in any other sorts of organizations, maximizing service quality is the focus of the Ethiopian public administration agencies. For the past decades, government has been engaged in reforming the structures, processes, procedures and personnel managements of public agencies with a clear goal of achieving and maintaining service standards. However, studies revealed that performance in the public sector is below expectations due to employee dissatisfaction, turnover, inconvenient work environments, low pay scales and reform fatigue (Kasa & Zekarias, 2020; Worku, 2019).

The Addis Ababa Water and Sewerage Authority (AAWSA) is one of the public agencies on which different reform tools have been implemented to improve its service delivery process and outcomes. AAWSA began its service provision in 1887, even before official establishment of the Ethiopian public sector agencies by Emperor Minilk-II in 1907. Currently, AAWSA is organized under a head office and nine branch offices located in different parts of the city. Out of these offices: the head quarter, Akaki, Nifas silk, Gurdshola, Addis Ketema and Arada were purposively sampled for this study.

As a capital city of the nation, Addis Ababa is the seat for international, regional and national public and private organizations. On top of that, it is one of the oldest and highly populated cities in Africa. This makes the quality of water and sewer services of AAWSA critical for the overall wellbeing and development of people and organizations of the city. These scenario demands AAWSA to stick its neck in search for variables that could influence quality of its services.

Even though there are studies so far done on the interaction among organizational trust, performance, employees' engagement, service quality and participatory decision making, most of these studies are conducted out of Ethiopia and in different contexts as well as conceptual frames and methods (Somech, 2022; Abera, Adem & Mulatu, 2022; Kumar & Saha; 2017, Ramseook-Munhurrun, Lukea-Bhiwajee & Naidoo, 2010; Jin & McDonald, 2016; Ermias, 2014). Moreover, as far as my literature search is concerned, there are no studies that conceptualize service quality as a measure of performance of public sector agencies.

Therefore, studying the relationship between organizational trust and service quality, with mediating roles of employee engagement and participatory decision making is crucial to bridge the literature

gap and contribute to the dynamics in human resource management endeavors of public sector agencies in Ethiopia.

Theoretical framework

The interplay among OT, PDM, EE and SQ was explained based on the theoretical foundations of the human relations and social exchange theories. The human relations theory (HRT) was developed in response to inhuman natures of the classical administrative and scientific management theories that emphasis on formal structure, control, efficiency, economy and hierarchical authority (Simonsen, 1997, Henry, 1995). The base of the HRT was a series of independent sets of experimental studies conducted by Elton Mayo and his colleagues at the Hawthorne Plant of Western Electric near Chicago, United States between 1924 and 1936 (Omodan, et. al, 2020). During the experiment, the intensity of the light was increased, which resulted in increased productivity. Surprisingly, intensity of the light was decreased but, productivity went-up. Accordingly, the researchers concluded that employees are not simply rational beings who responded to economic and environmental stimulus only; rather, humanism and socio-psychological factors play a role in employee productivity (Westover, 2014; Sinek, 2009; Simonsen, 1997; Henry, 1995).

The HRT accentuates on the point that in addition to physical conditions and economic benefits of work, attitudes, relationships, feelings of belonging, interpersonal skills, participative decision-making, trust and effective communication play a key role in the performance and effectiveness of organizations (Bruce & Nyland, 2017). Participatory decision making (PDM) is embedded by HRT in the sense that inclusion of employees in the decision-making process boosts the employees' self-esteem creates a sense of belongingness and obligation towards meeting organizational goals and enhancing productivity (Tracy, 2011, Black & Gergersen, 1997). According to HRT, these needs are more important than material and financial benefits in motivating people (Omodan et. al, 2020, Westover, 2014).

On the other hand, the social exchange theory (SET) emerged at the end of the 1950s, focuses on presuming social behavior in dyadic and group settings by applying the economic concepts of cost-benefit analysis to social behavior (Davlembayeva & Alamanos, 2023). According to Homans (1961), group members' behavior towards each other is regulated by rewards and punishments in a way that rewards reinforce positive behaviours and punishments inhibit the opposite ones. Similarly, Blau (1964) analyzed the theory from the perspectives of utilitarianism and concluded that what motivates good behavior among groups is the anticipation of rewards in the future. Such reward could be social power, money or minimized costs compared to other relationships.

Both HRT and the SET resulted in convergence of sociological, psychological and economic views of human behavior in relationships on the point that they agree on interdependence and reciprocal nature of human behaviour. When organizations trust in the worth of their employees', they set a PDM environment, and earns trust from their employees (Sinek, 2009). This trustworthy relationship between the organization and its employees' serve as a competitive advantage that could not be imitated by others in the industry (Al Golin, 2004). Because, when employees' feel that their organization cares for their interests and benefits, they respond in a similar manner by getting fully engaged in their jobs and performing at their maximum levels (Maxwell, 2011, Sinek, 2009; Covey, 2006, Al Goline, 2004).

Review of related literature and hypothesis development

Organizational trust

Trust is defined as a psychological state that involves the intention to take risks based on positive expectations about the intention of another person in unpredictable situations (Mayer, Davis, &

Schoorman, 1995). Organizational trust is a soft-bedrock value that impacts the organization's performance in various ways (Covey, 2006; Al Golin, 2004). Further, trust is conceptualized as having three strands: trust within organizations, inter organizational trust and trust between organizations and customers (Vanhala & Tzafrir, 2021). Trust within organizations could be studied under one of the two forms or both (interpersonal Vs. impersonal). Interpersonal trust deals with the relationship between employees and leaders at different levels as well as among co-workers, whereas impersonal trust is defined as 'the individual employee's expectations about the employer organization's capability and fairness' (Vanhala et al., 2011, Shockley-Zalabak et al., 2010). Capitalizing on the impersonal dimension of OT, Shockley-Zalabak, et al. (2010), developed a trust model with five predictors namely: competence, reliability, concern for employees, openness and honesty and identification.

Research so far has shown that there is a positive association between OT and organizational performance. Ning et al., (2007) conducted a study on the influence of employees' trust in top leaders, immediate supervisors and their co-workers on employees' performance. They found out that employee trust in the three entities of trustees is vital for improved performance. Another study by Silla et al., (2020) dealt with influence of magnitude of organizational trust in leadership and consensus about this trust on job satisfaction, with a mediating role of perceived communication quality. Findings indicated that the effect of magnitude of employees' trust in leadership on job satisfaction is fully mediated by perceived communication quality. On top of that, consensus on employees' trust in leadership is found positively and directly correlated with job satisfaction. There is also a study by Singh and Desa (2018), on the effect of organizational trust on employees' job performance in the public sector. Results showed that there is a positive correlation between organizational trust and employees' job performance.

3.7.1. ***Service Quality (SQ***)

As a result of the emphasis given to the new public management movements of the 1990s, improving SQ, defined from customer perspectives, became one of the performance indicators in public sector organizations (Black, Briggs & Keogh, 2001, Diefenbach, 2009). SQ is understood as a measure of a service's ability to live up to the average customer's expectations about its value (Hassan, 2012). Since SQ is mainly defined from the perspectives of customers' expectation, this makes it mean different things to different customers. That is why, it is easier to identify quality in products but complicated in the case of services due to their intangible, inseparable and heterogeneous features (Ramya et al., 2019; Kenyon & Sen, 2015).

To sustainably succeed in their business, organizations must create value to customers, employees' investors and society (Sinek, 2009). Nonetheless, SQ is not evaluated just in terms of the outcomes only; but also, it takes into consideration the whole process of service delivery (Goetsch & Davis, 2014; Black et al., 2001). Accordingly, Parasuraman et al., (1988), proposed a SQ measurement model with five dimensions namely: tangibles, reliability, assurance, responsiveness and empathy. The main mission of public service organizations is provision of quality services that realize benefits of the public policy objectives (Black et al., 2001). Studies show that SQ is determined by employee commitment, PDM, work environments, bureaucratic red tapes, pay scales, employee competence and employees' sense of belongingness to the organization (Gebre, 2022; Alemseged & Hailay, 2019; Desalegn, 2014; Ermias, 2014; Polate, 2009). Further, a study by Nidhi and Kumari (2016) on quality of services in the public sector revealed that, compared to that of the private sector, public sector service quality is low due to management inefficiency, lack of transparency, absence of customized services, delayed services and insufficient equipment and resources.

Organizational trust and service quality

Presence of trustworthy relationship between an organization and its employees is reflected in the level of employees' performance (Tracy, 2011, Al Golin, 2004). Trust creates a reciprocal behaviour whereby the employees keep saying that 'if the organization trusts me, then I will trust it back and give it the best I can' (Maxwell, 2011; Sinek, 2009). Such relationship enables organizations drive the best level of performance out of their employees (Covey, 2006; Simonsen, 1997). The ultimate locus of such best contribution of employees is realized in the level of quality of the services provided to customers (Black et al., 2001). Employees of trustworthy organizations provide service that is characterized by availability of tangibles, assurance, reliability, responsiveness and empathy (Parasuraman et al., 1988).

Empirical studies revealed that employees of the Ethiopian public sector organizations are dissatisfied with the work environment, compensation scales and fringe benefits (Selam & Belay, 2018; Worku, 2019). This dissatisfaction is one of the factors determining their performance (Kassa & Zekarias, 2020). However, having well established trust deposits, compensates for dissatisfaction, serves as a tiebreaker, a spirit de corpus, and motivates employees to contribute their level best for their organization, even in the absence of satisfaction with extrinsic factors (Al Goline, 2004). Therefore, I proposed the following:

H1. Organizational trust is positively related to service quality.

Organizational trust and participatory decision making

Every organization prospers or fails because of the quality of decisions made by its leaders (Collins, 2011). Ensuring employees' participation in decision making is the essential element– "or a raison d'etre" of good leadership (Lindlow et al., 1989). PDM gives chance to those involved to incorporate their views, provide different alternatives of solving the problem at hand, improve quality of the decision as well as be diligent to its implementation (Lawal & Yusuf, 2014).

Trust based organizations consider their employees as critical assets and involve them in decision making (Asikhia, 2014; Al Golin, 2004; Somech, 2002; Simonsen, 1997; Black & Gergersen, 1997). The degree of Employees' meaningful involvement in decision making indicates the extent of trust between the employees and their organization and vice-versa (Shuck et al., Adelson & Reio, 2016, Tracy, 2011). Besides, the complex pattern of relationship that exists between the organization and its employees is a critical factor that determines quality of participation of employees in decision making (Sinek, 2009; Al Golin, 2004). This is so because, it is natural for employees to see and understand every decision made in the organization through the prism of the relationship they have with the organization (Sinek, 2009; Parish & Cadwallader, 2008; Covey, 2006).

Black and Gergersen (1997, p.861) stated that PDM has both humanistic and human relations grounds. Essentially, the humanistic rationale argues that people have the right to participate in decisions that affect their lives. The second rational, labeled as the "human relations" contends that participative decision-making is an instrumental way to achieve higher productivity, efficiency, profits, or other valued organizational results such as employee retention, reduced turnover, lower complaints and cooperation among various work divisions (Al Golin, 2004).

Even though PDM is one of the highly researched concepts in organizational leadership and management, most of the scholarly works considered PDM as a uni-dimensional concept (Sinek, 2009, Black & Gergersen, 1997). However, Somech (2002) conducted a study on PDM in schools' decision making by operationalizing PDM as a multi-dimensional construct having four

dimensions namely: structure, rational, target, and domain. Previous studies show that there is direct relationship between organizational trust and the level of employees' participation in decision making (Yassien, 2023; Yassien, et. al. 2023; Shagholia, et. al., 2010). Therefore, the following hypothesis is proposed to be tested in this study:

H2. Organizational trust is positively associated with participatory decision making.

Organizational trust and employees' engagement (EE)

Employee engagement (EE) is a construct which deals with the extent of employees' physical, emotional and cognitive emersion in their jobs (Kahn, 1990). EE implies the emergence of motivation, active participation and involvement of workers in all production processes, which should favorably influence the growth of labor efficiency (Houle et al., 2021; Budriene & Diskiene, 2020).

Employees could get engaged in their jobs if nature of the work is physically, mentally, emotionally and spiritually attractive to them (Sinek, 2009; Covey, 2006). Engaged employees are self-employed in their workplace and they reflect a sense of involvement, flow, mindfulness, and intrinsic motivation (Shuck et al., 2016; Tracy, 2011).

According to Kahn (1990), and Hackman and Oldham, (1976), EE is mainly affected by task characteristics, role characteristics and work interactions. When the work design is challenging, clearly delineated, varied, creative, and somewhat autonomous, it gives them more meaning and keeps them engaged. On top of that, if the role enables them to feel valuable, when peoples' roles earn them influence and status in the system, it gives them psychological meaningfulness. Most importantly, work environments filled with lively and rewarding interpersonal interactions with co-workers, leaders and customers reflects the trust deposits of the organization. Organizations trusted by their employees have competitive edges that enable them to attract competent and trustworthy employees, retain them for longer time and maintains good employee moral even in difficult times (Covey, 2006, Al Golin, 2004).

Studies show presence of direct and positive association between OT and EE (PouAhmadi, & Ahmadizad, 2015; Ugwu et al., 2014). A study by Gebre (2022), on public employees' commitment towards execution of organizational goals in Addis Ababa indicated that employee disengagement, unnecessary political interference, poor leadership support, discriminatory employee treatment, unfair incentives and remuneration and employee dissatisfaction, are resulting in low level of employees' commitment which again affects the public employees' ability to perform organizational goals at the expected level. These determinants of employees' commitment reflect lower levels of OT in the studied organizations (Shockley-Zalaback et al. 2010, Covey, 2006). Accordingly, I proposed the following:

H3. Organizational trust is positively related with employees' engagement.

The interplay among OT, PDM and SQ

Organizations with higher trust deposits are posited to involve their employees in their decision-making process (Al Golin, 2004). Employees' participation in organizational decision makes them feel sense of ownership and responsibility towards full implementation of such decisions.

Participative cultures put psychological pressure on their employees and move them to perform not only the in-role duties but also extra-role duties, reflecting citizenship behaviour towards their organization (Polat, 2009). In business environments shaped by rapid changes, organizations could not dictate all necessary behaviours expected from their employees. Instead, organizations benefit by establishing a trustworthy relationship with their staff, avoid micromanagement and leave situational measures under discretion of their employees. To that end, it is mandatory for

organizations to understand the importance of stakeholders' meaningful participation throughout the product or service design, delivery and experience process to improve quality and add value sustainably (Kenyon & Sen, 2015). Therefore, it is proposed that:

H4. Participatory decision making mediates the relationship between organizational trust and service quality.

The interplay among OT, EE and SQ

As per the social exchange model, employees respond to such behaviour of their organization by exerting utmost effort and care they could give it (Ugwu, Onyishi, & Rodrı´guez-Sa´nchez, 2014). When employees feel that they are working for a trustworthy organization; their self-esteem boots up and help them bring the whole of themselves to their workplaces (Tracy, 2011, Khan, 1990). The trust they have in their organization also make employees focus on all the details of their organization's strategy (mission, vision and values); the features of their specifically given roles and the standards of performance (Loehr, & Schwartz (2003). Therefore, the following mediation hypothesis is proposed to be tested.

H5. Employee engagement mediates the relationship between organizational trust and service quality.

Conceptual framework of the study

As depicted by Figure 1, the level of OT in the organization directly affects the status of SQ via path "C". On top of that, prevalence of trust between organizations and their employees creates fertile ground for employees' involvement in the decision-making process (a1) and enable organizations to improve their SQ (b1). On the other side, when OT prevails, employees come to work every day with their whole selves and get engaged in harmonizing the work process (a2) and deliver services of the required quality (b2). Thus, the level of SQ in any organization is determined not only by OT but via the mediating roles of PDM and EE.

Methodology

This study adopted explanatory research design and an explanatory sequential mixed methods approach (Creswell, 2009). Further, the study made use of both primary and secondary data types. Quantitative primary data were collected from leaders, employees and customers of AAWSA; likewise, qualitative data were gathered via in-depth interviews with leaders of AAWSA, the labour union and customer forums. Secondary data were also taken from the organizations' human resource department (2023).

Sample size was determined using Yamane's formulae (1967, p. 886, cited in Israel, 2003, P.4), which runs as: $n=N/1+N\ (e^2)$. Accordingly, 400 employees and 400 customers were sampled. On top of that, 75 leaders were included in the study via census method. Four types of questionnaires composed of both close-ended and open-ended items were used in this study. The first questionnaire dealt with OT and was developed based on Shockley-Zalabak et.al's (2010) model of OT. The second questionnaire measures PDM as operationalized by Somech (2002). Besides, the EE questionnaire was developed based on Kahn's (1990) model (Houle et al. 2021). And finally, the SQ questionnaire developed by Parasuraman et al., (1988) was adopted. Reliability of the questionnaires was met based on Cronbach alpha test and their validity was cross-referred from relevant literatures and expert reviews.

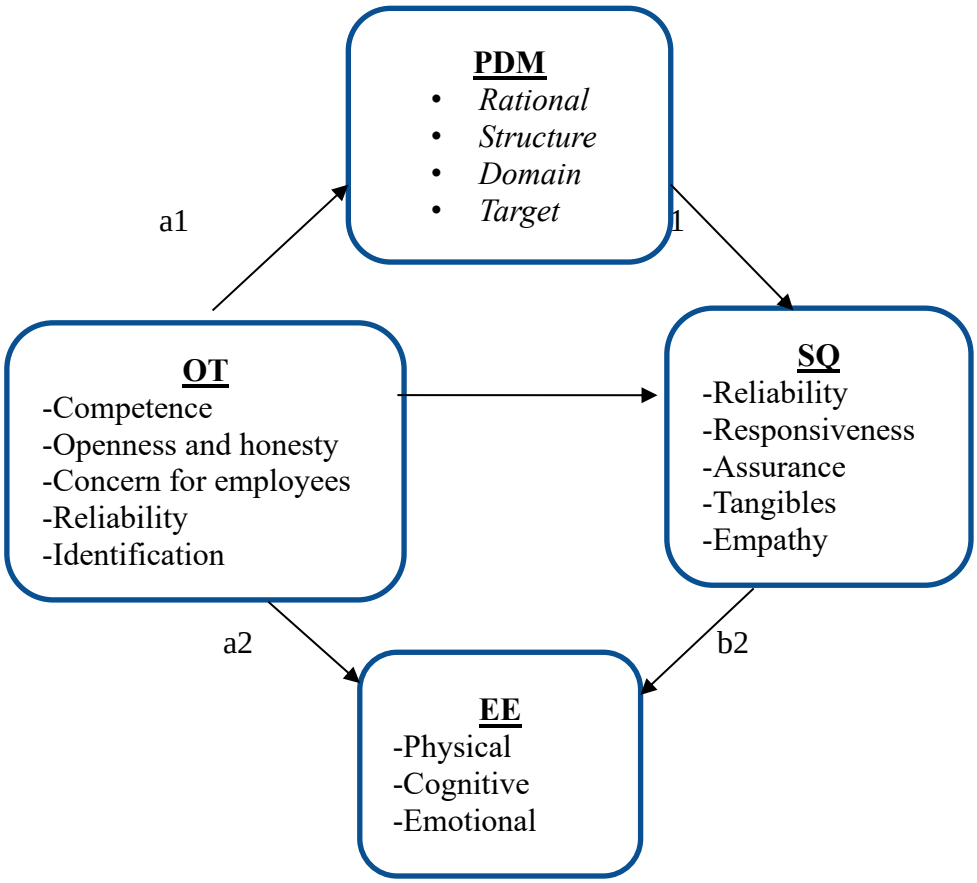

Figure 1: Conceptual framework of the study
Source: Developed by the researcher based on literature review, (2022).

The structural equation modeling (SEM) was conducted using SPSS-AMOS version 21. Results of the quantitative data analysis are presented using Tables and Figures; whereas the qualitative data were thematically interpreted and presented in a narrative way (Roulston, 2014).

Results and Discussion

The direct, indirect and total effects of OT on SQ via mediations of EE and PDM in AAWSA

The structural equation modeling (SEM) requires fulfillment of the requirements of uni-dimensionality, reliability, composite reliability, construct validity, convergent validity, discriminant validity and average variance extracted as preliminary procedures. All these assumptions were checked via confirmatory factor analysis and met as per the statistical standards. Results of the factor analysis are presented in Figure 2.

The next step in SEM analysis is checking fitness of the measurement model. Accordingly, it was checked against the standard values of chi-square discrepancy, SRMR, RMSEA, GFI and CFI. On top of that, the standardized co-variances metrics shows that OT1----EE2; OT3----EE1 and OT4----EE1 have values greater than 2. These values were 3.456, 4.194 and 3.558 respectively. Hence, these dimensions of OT were omitted from the SEM analysis and the model was run again. The final model fit indices are presented in Table 5.

Table 1: Model fitness indices

Category	Name of index	Acceptable value	Score	Judgment
	RMSEA	<0.8	0.028	Accepted
	SRMR	<0.8	0.019	Accepted
Absolute fit	GFI	>0.90	0.966	Accepted
Incremental fit	CFI	>0.90	0.989	Accepted
Parsimonious fit	Chis/DF	<5	1.31	Accepted

Source: Awang, (2014, p. 64) and Kline (2005, pp. 269-278).

These model fit indices give the researcher a green light to proceed to the main SEM analysis: to determine strength of the direct, indirect and total effect of OT on SQ via mediations of EE and PDM. Results of this analysis are presented in Figure 3 and Table 6.

Table 2: Direct, indirect and total effects

Hypothesis	Direct effects	Indirect effects	Total effects	Effect size	P. value	Decision
PDM< ---OT	0.031			Small	.670	Rejected
EE< ---OT	0.300			Large	.002	Accepted
SQ< ---OT	-0.145			Medium	0.033	Accepted
SQ< --PDM< ---OT		0.000		Null	0.987	Rejected
SQ< --EE< ---OT		0.012		Small	0.616	Rejected
SQ< ---EE< --PDM< ---OT			-0.159	Medium	0.035	Accepted

Source: Own analysis using SPSS-AMOS, (2023).

To determine the strength of effect sizes of the regression weights, the standardization of Cohen (1988) cited in Ellis, 2010, p. 41) is used. According to these authors, a regression result above the cutoff point of .26 is large, .13 is medium and.02 is small.

Findings of the SEM analysis proved that the direct effects of OT on EE (.30) are large and statistically significant (p=.03); on SQ (.14; p=.03) is medium and statistically significant (p=.03), and on PDM (.03) is small and statistically insignificant (p=.670). Again, the indirect effect of OT on SQ via PDM is almost null and statistically insignificant (p=.978); while the indirect effect of OT on SQ via EE is small (.012) and statistically insignificant (p=.616). Whereas the total effect of OT on SQ which is the summation of the direct effect, and the total indirect effects is medium (-.159) and statistically significant (p=.03). Hence, it could be concluded that, in AAWSA, PDM and EE do not significantly meditate the effect of OT on SQ.

Discussions

Theoretically, OT is being propagated as a bedrock soft variable that promotes organizational success when everything runs ok; and saves the organization from getting collapsed when it did some wrong for any reason (Sinek, 2009, Covey, 2006, Al Golin, 2004). Thus, organizations are advised to deposit much trust in their trust accounts. Organizations with high OT deposits will have high levels of PDM and EE. However, AAWSA's level of OT is of a moderate level. With this level of OT, it is very difficult to have honest participation of employees in decision making (Parish & Cadwallader, 2008). On top of that, AAWSA has structurally omitted individual participation of employees in decision making. They may indirectly participate via their labour union in matters that are purely related to employees' benefits, rights and wellbeing. That is why

again the level of PDM at AAWSA remained moderate.

Surprisingly enough, the level of EE is found high in AAWSA. As explained by leaders and employees, this is due to the employees' liking of their jobs and the responsibility they feel as a public servant (Shuck, Adelson & Reio, 2016; Cascio, 2003). In addition to employees' feeling of responsibility, the interviewed leaders also stated that AAWSA's transactional and highly controlled work environment could be the cause of their high engagement (Avolio, & Bass, 2002). Prevalence of higher level of EE is expected to result in higher level of SQ (Budriene & Diskiene, 2020, Loehr & Schwartz, 2003). The status of EE in AAWSA is high but its SQ is of a moderate level. The intriguing finding here is that "why AAWSA's SQ is not high in the presence of high level of EE? According to explanations given by the interviewed leaders, AAWSA has limitations and challenges in its service delivery. The limitations are related to presence of untrustworthy work environment and absence of comprehensive PDM. On top of that, AAWSA's lack of autonomy to revise water tariffs and to assign competent top and middle level leaders, presence of deteriorated water and sewerage infrastructures, presence of outdated work rules and structures, production of uniform quality of water for all types of activities, managements and employees' low appetite to adapt to changing situations and shortage of vehicles are its limitations. Further, since the nature of AAWSA's business requires synergetic and cooperative efforts from many stakeholders, absence of adequate leadership commitment from both stakeholders and AAWSA itself could be seen as a limitation.

The authority's challenges in its service delivery are reduction in the level of available surface and underground water resources due to climate change and high rates of construction projects, contamination, high rates of urbanization, high altitude in some parts of the city, customers' weak culture of water usage, lack of right of way, misunderstanding of the nature of AAWSA's business by top decision makers at the city level and red tape bounded procurement system are the main challenges of AAWSA. These findings on limitations and challenges of AAWSA are similar with those of Hailu, W. (2017). Zemichael, (2019) and Desalegn, (2014), who studied AAWSA's water supply in the peri-urban areas and Causes and Challenges of Urban Water Supply in Mekelle city administration, respectively.

Results of the SEM analysis indicated that the direct effect of OT on SQ is of medium level and statistically significant. Besides, OT's direct effect on EE is large and statistically significant. Hence, AAWSA could benefit by enlarging its trust deposit to ensure better levels of EE and SQ. Nonetheless, OT's direct effect on PDM is small and statistically insignificant. That means, OT does not make meaningful contribution to ensure PDM at AAWSA. This finding is contradictory with the theoretical propositions (Shockley-Zalabak et. al., 2010, Sinek, 2009, Covey, 2006; Somech, 2002). AAWSA's decisions are made in two ways: (a). decisions on matters that affect employees' benefits are made in participation of their labour union; (b). other organization related matters (reforms, work rules, organizational strategy, organizational structure… etc) are determined by the city administration and/or AAWSA's top and middle level leaders. On such matters, let alone ordinary employees', the lower-level leaders do not participate. Hence, PDM could not mediate the effect of OT on SQ. The analysis also indicated that EE does not mediate the effect of OT on SQ, because AAWSA's high level of EE is not driven by its level of OT but by other factors namely presence of highly controlled work environment and the employees liking of their jobs.

Conclusion

The purpose of this study was to analyze the effect of OT on SQ with the mediating roles of PDM and EE. Results of the SEM analysis also indicated that the direct effect of OT on SQ is of medium

level and statistically significant. Besides, OT's direct effect on EE is large and statistically significant. Nonetheless, OT's direct effect on PDM is small and statistically insignificant. The mediation analysis also revealed that both PDM and EE do not have statistically significant mediation effect on the relationship between OT and SQ.

Thus, AAWSA needs to rethink the statuses of and the links among its OT, PDM, EE and SQ. Specifically, it must work on the openness and honesty and identification dimensions of OT. Likewise, a PDM framework that enables individual participation of employees in organizational matters should be designed and implemented. If so, the trustworthy environment could generate genuine EE. Besides, AAWSA needs to emphasise on creating synergetic cooperation with various stakeholders. Otherwise, the city's residents and development projects will suffer from lack of quality water and sewer services soon.

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3.8. A study of Person-work Environment Fit Perceptions on employee performance in selected Civil Service Sector employees in Addis Ababa and Dire Dawa

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Abstract

Scholars of organizational behaviour have long been interested in understanding the interactions between employees and their environments, and how these interactions can influence employee work engagement and performance. This study aims to explore factors affecting work engagement and job performance based on person-environment (PE) theory and to examine the extent how PE fit in civil service sectors. The study analyzed the responses from 942 sampled employees of two city administrations (Addis Ababa and Dire Dawa) and the collected data was analyzed using descriptive statistics, factor analysis, correlation and structural equation analysis. The finding of this study shows that mean perceived score of all the PE fit dimensions -person-job fit (PJ), person-organization (PO) fit, person-group (PG) fit, and person-supervisor (PS) fit are above the average score for the seven-point Likert scale measurement. The spearman correlation result shows the all the PE fit dimensions have a significant (p-value<0.05) and positive relationship with employee work engagement and job performance. The structural equation model analysis shows that employees with a higher person-job fit, Person-group fit, and Person-supervisor fit have a higher work engagement and higher job performance and it is significant (p-value<0.05). According to the results, suggestions are proposed, leaders in the municipal should retort when important issues arise, made decisions, prompt responding to urgent questions and they should avail when needed. Civil service sector managers should take actions to effectively promote employee's PJ fit, PG fit, and PS fit to improve their work engagement and job performance.

Keywords: *PJ fit, PO fit, PG fit, PS fit, PE fit, work engagement, job performance*

Introduction

Background of The Study

The Federal Government of Ethiopia has introduced a series of improvements in the public sector over the past few decades. However, initial studies and observations show that such efforts are far from achieving the goals of the government sector. The studies call for further investigation into the problems of poor task performance in Ethiopia (Tadesse, 2019).

Many organizations struggle to achieve high levels of performance. Many more struggles to sustain them. While managers set organisational targets or attempt to implement new strategies or actions that improve their performance, the common result is a slew of unfinished projects, disengaged employees, and disappointing results.

One of the most important questions for organizations is how to make employees perform high (Eggerth, 2008). About the global economy of the 21st century, organizations must cope with rapid changes and increasing challenges (Cesário & Chambel, 2017; Sonnentag, 2002). To maintain

competitive advantage, the enhancement of employee performance is required more than ever. As such, researchers are, despite years of research, still concerned with the identification of the various attributing factors to work-related performance (Koopmans *et al*., 2011).

Many scholars on human resources ascertained that the fit between the individual value with organization (person-organization fit) and the fit of the individual value with the job (person-job fit) are the main conditions for organizational success and performance (Kristof-Brown, 2006). The match or congruence between a person and an environment is a commonly used context for understanding the attitudes and behaviour of organizational characteristics (Kristof-Brown et al., 2005). Scholars of management and psychology have been interested in the interaction of employees and the organisational environments for decades (Parsons, 1909; Schneider, 1987, as cited in Edwards & Billsberry, 2010).

Finding a suitable job is important. People spend a lot of time and effort looking for a suitable job, matching their skills and abilities, and meeting specific needs and goals and values. Similarly, organizations spend substantial effort to select persons who will best meet the demands of the job, adapt to training and changes in job demands, and remain loyal and committed to the organization. According to Kristof-Brown et al. 2002 and Jansen and Kristof-Brown 2006, P-E fit can be defined as the match between the values, goals, and personality of an individual and those of that person's environment. The term "environment" in the definition of P-E fit above, is a very wide-ranging concept. Kristof-Brown et al. 2002, split up the term environment into four different domains or factors P-J fit, P-O fit, P-G fit, and P-S fit based on how it is evaluated. Person job fit (P-J fit) is evaluated to see how far the employees is fit with their job, person organization fit (P-O fit) is evaluated to see whether the employees are fit in the organization, person group fit (P-G fit) is evaluated to see how far the employee is fit within the group of other employees working in the organization, person supervisor fit (P-S fit) is evaluated to see the depth of relationship that exist between supervisor and employees in the organization.

Poor fit between the employee's needs (needs-supplies fit) as well as the job environment's demands (demands-abilities fit) was associated with low task performance. The term needs-supplies fit refers to the degree to which employee needs, such as the need to use skills and abilities are met by the work environment's supplies and opportunities to satisfy those needs. Demand-abilities fit refers to the degree to which the job's demands are met by the employee's skills and abilities. The two types of fit can overlap. For example, work overload may leave the employer's demands unmet as well as threaten the employee's need to satisfy others (Caplan, 1998).

Studies of person-environment fit shows that people interact with multiple dimensions of the environment simultaneously. This multidimensional nature of the environment fit suggests that many of the consequences attributed to fit are not simply a matter of fit or misfit with a single aspect of the environment. Rather, it has significant consequences on the individual and organizational outcomes, with better fit associated with better outcomes (Cable and Edwards, 2004). P-E fit studies are since individuals are becoming more involved with their environment and that employee behavior is influenced by both environmental factors and individual traits.

According to Jansen and Kristof-Brown (2006), the PE fit studies is "elusive criterion of fit". The problem is both personal behaviors (individual factors - Personality, values, goals, etc) and environmental characteristics (environmental factors - jobs, supervisors, groups, organizations, vocations, etc.) are multidimensional. Researchers have been faced with the seemingly impossible problem of capturing all the personal behaviours and environmental characteristics. As a result, researchers did not know the many different forms of fit and how it fits together (Jansen and Kristof-Brown, 2006). Most researchers usually select certain variables from individual factors

and environmental factors to construct interaction terms, to which the approach can discover the relationship between specific variable combinations and outcome variables but can hardly explain the relationship between outcome variables and the interaction between individuals and environment (Wang and Sun, 2010).

P-E fit measurement can be viewed as subjective and objective (Caplan, 1987 and Kristof, 1996). Subjective includes self, co-worker, and superior report, which is perceived by the target person or employee. Subjective fit represents the perceived fit of the employee. Objective fit includes facts about the person and environment which are not perceived by the person. It is a 'real fit' and free of the bias of human perception.

Perceived fit is usually captured via subjective methods, that is, research instruments that allow respondents to report a direct assessment of their compatibility (Kristof et al., 2005). A research result shows that perceived fit is a much stronger correlate of behavioural and psychological outcomes than the objective forms of fit (Kristof-Brown et al., 2005). This study plans to apply the subjective fit to measure the perceived views of employees about their needs, demands, supplies, abilities, teams, supervisors and organizations (Janssen, 2000). Schneider states that people's preferences about organizations are based on their own judgments that agree with their own behaviours and the behaviours of organizations (Schneider et al., 1995). Similarly, Kristof-Brown et al., 2005 recommends perceived fit to study the fit as it assesses a person's overall sense of fit to their employing organization which also allows respondents to judge and report their direct compatibilities. Moreover, study results confirmed that perceived fit has a stronger relationship with behavioural and psychological outcomes than the objective forms of fit (Kristof-Brown et al., 2005).

According to Greguras and Diefendorff (2009), it is important to understand the appropriate level of P-E fit as it affects the professional development of employees at different stages of the organization's life cycle. In the pre-hire stage, the knowledge of P-E fit is often used for career counselling and job searching (Jansen and Kristof-Brown, 2006). The study shows that much of the P-E fit research has been conducted in the post-employment period and long-term tenure of employees, and the results show a strong relationship between P-E fit and employee attitudes toward work. The target population for this study will be employees of civil service experts who are working at different levels.

Studies also show that the interaction between person and environment in a civil service organization affects not only the employees task performance consequently it affects the service recipients (customers). Thus, we need to understand how people interact with their environment in civil service organization.

Beyond the direct effects of P-E fit on task performance, this study will see how the work engagement and organizational commitment relates with the task performance. Therefore, I will also examine the indirect effects of P-E fit on task performance through engagement. More precisely, to gain more insight in the relationship between the variables under study, we will explore the nature of the relationship of the four types of fit and task performance by analysing the mediating role of work engagement and organizational commitment. Various studies have found that indicators of organization commitment and work engagement (which is indicators of work motivation) predicts task performance Andela and van der Doef (2019).

Work engagement

Theoretically, work engagement is linked to all kinds of positive outcomes for organizations. Engaged workers are full of energy, committed to the organization and work hard, without developing work-related stress complaints. In this sense, engaged employees are not only

productive, but their positive work attitude creates a positive atmosphere at work as well. There is some evidence that this positive atmosphere also positively affects others at work. Engaged workers are satisfied with their work and are less likely to leave their jobs. In the past decade research has focused on these effects of work-engagement. Several studies have found evidence for the positive effects of work-engagement on organizational outcomes. Work engagement appears to be related to better performance Psychosocial risks and job performance.

Research has revealed that engaged employees are highly energetic, self-efficacious individuals who exercise influence over events that affect their lives (Bakker, 2009). Because of their positive attitude and activity level, engaged employees create their own positive feedback, in terms of appreciation, recognition, and success. Although engaged employees do feel tired after a long day of hard work, they describe their tiredness as a rather pleasant state because it is associated with positive accomplishments. Finally, engaged employees enjoy other things outside work. Unlike workaholics, engaged employees do not work hard because of a strong and irresistible inner drive, but because for them working is fun (Gorgievski, Bakker & Schaufeli, 2010).

Individuals engaged in their work have a high level of energy, are passionate for their work, and are fully absorbed in their activities. Although the concepts of work engagement and P-E fit are somewhat interrelated, they are not synonymous. P-E fit is generally the compatibility between the individual and their environment, but work engagement is whether the employee is actively involved in advancing organizational goals.

Work engagement has received considerable attention in recent times as a mediating construct linking P-E fit and positive workplace outcomes. Work engagement is "a positive fulfilling work-related state of mind characterized by vigour, dedication and absorption" (Schaufeli et al., 2006, p. 702). Highly engaged employees exhibit high-quality behaviours and performance (Muduli et al., 2016). Evidently, high work engagement results in greater profitability, shareholder returns, productivity, and customer satisfaction (Harter et al., 2002; Saks and Gruman, 2014). A growing body of research recognises work engagement as a key mediator of P-E fit- task performance models (Juhdi et al., 2013; Saks, 2006; Schaufeli and Bakker, 2004). Despite its importance, the mediating role of work engagement between P-E fit and task performance is scarcely explored.

Statement of the problem

According to the former Ministry of Civil Service (2013), the awful attitude of public servants, skill and knowledge gaps of the pubc servants and resource constraints are key factors affecting the performance of the current public service sector in Ethiopia. The awful attitudes and skill and knowledge gaps of the employees are categorized as personal traits while the resource constraints are under organizational characteristics. However, there is no comprehensive study on the identified gaps of the individual and organizational factors as well as with the attitude of public servants in relation to the performance of the public sector in Ethiopia (Kassa Teshager and Zekarias Minota, 2020). Existing studies on individual and organizational factors determining the performance of public servants are not comprehensive and up to date (Kassa Teshager and Zekarias Minota, 2020).

Empirical literature findings revealed that P-E fit has significantly positive effects on various individual, e.g. engagement, job satisfaction, task performance, and organizational outcomes, e.g. team engagement, psychological ownership, fiscal performance (Han, Chiang, McConville, & Chiang, 2015; Hardin & Donaldson, 2014; Lauver & Kristof-Brown, 2001; Kristof-Brown, Zimmerman, & Johnson, 2005). Specifically, higher perceived fit results in a higher level of employees' performance (Kulik, Oldham, & Hackman, 1987; Milliman et al., 2017). However, although the P-E fit – outcome relationship has been largely studied, little is known about the

underlying mechanisms through which P-E fit leads to employee performance (Greguras & Diefendorff, 2009). Previous studies indicated the need to examine the role of personal factors in the relationship between P-E fit and performance (KristofBrown et al., 2005)
However, more research is required to determine how the different domains of fit work together (Catano et al., 2005; Horn et al., 2008; Jansen & Kristof-Brown, 2006) to influence organizational commitment and withdrawal behaviours and also to determine the practicality and legal

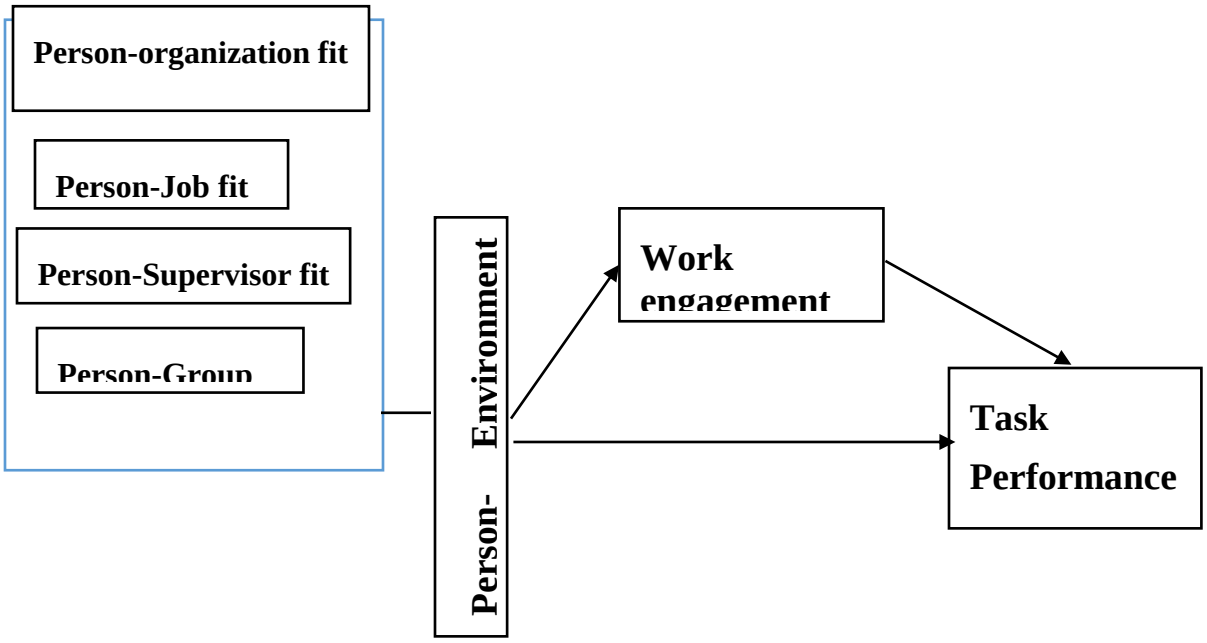


Figure 1: Conceptual framework of P-E fit, work engagement and task performance (Adopted from Xiong, B., 2015).

defensibility of using person-environment fit measures for selection (Arthur, Bell, Villado, & Doverspike, 2006; Werbel and Gilland, 1999). To my knowledge, no study has so far tested all the different person- environment fit on task performance simultaneously. Although P-E fit dimensions are shown to be important factors relating to the outcomes like - job satisfaction, tenure, staff turnover, work engagement, organizational commitment, absenteeism, organizational citizenship behaviour, and task performance in various contexts, little is known as to how these factors together account for the enhancement of these outcomes particularly on task performance. Many scholars of P-E fit touted a high degree of fit of the employee with his environment, which has a positive effect on both his own performance and that of the organization (Kristof, 1996; Taris, 2003). But what aspects determine whether an employee has a good fit with an organization? And to what extent are these elements on their own important for sustainable performance? Studying and exploring the nature of Person-environment fit and its dimensional impacts on outcomes will help to understand and resolve work-related issues within the organization. The present study attempts to identify the various facets of the person-environment P-E fit (Person-job fit, person-organization fit, person-group fit, and person supervisor fit) of public sector employees on task performance among the mediator effect of commitment and motivation.

Researchers have suggested that more qualitative and exploratory research is needed to satisfactorily explore individuals' experiences of being a fit in the workplace (Follmer et al., 2018;

Talbot & Billsberry, 2010). More replicate studies are needed in the future on P-E fit (Rein De Cooman, 2019).

Studies cited in this proposal are mainly from Western perspectives. However, Ahmad and Khairuddin (2003) have already shown that P-E fit theory can be applicable to a developing country such as Malaysia. This study can provide more evidence of such a contention. This also indicated that little is known about the process through which organizations promote P-E fit in developing countries (Sekiguchi, T., 2006). Moreover, to the best of my knowledge, there has been no study in the public sector yet as expected, on all P-E fits and its impact on performance. So, a better understanding is needed in the civil service sectors to know which dimensions of P-E fit is more related with job performance and work engagement.

In response, this study aimed to assess the prevalence of dimensions of P-E fit in civil service sectors and its effects on job performance using the mediating effect of commitment and motivation.

Objectives of the study

General objective

The general objective of the study is to assess and examine the person – work environment fit on job performance mediated by work engagement in Ethiopian Civil Service Sector employees.

Specific objectives

- *To examine the person – work environment fit in public sectors of Ethiopia.*
- *To assess the possible relationships person – work environment fit, task performance and work engagement in public sectors of Ethiopia.*
- *To examine the mediating effect of work engagement on the relationship between P-E Fit and task performance.*

Research questions:

- Do person - job fit perception of the employee related with task performance?
- Does person- organization fit perception of the employee related with task performance?
- Do person - group fit perception of the employee related with task performance.
- Do person-supervisor fit perception of the employee related with task performance.
- Is work engagement of the employee mediates the effects between person – work environment fit and task performance?

Operational definitions

Fit - "similarity, congruence, alignment, agreement, composition, compilation, configuration, matching, and interactionist" between person and environment (Harrison, 2007).

P-E fit – "the degree of compatibility or match between individuals and some aspect of their work environment" (Kristof-Brown et al., 2005; Milliman et al., 2017).

P-J fit – Kristof (1996) identifies a job as "the tasks a person is expected to accomplish in exchange for employment, as well as characteristics of those tasks"

P-O fit - the compatibility between people and organizations that occurs when: at least one entity provides what the other needs, or they share similar fundamental characteristics, or both (Kristof, 1996).

P-S fit – denotes the match between an individual and his or her supervisor in a work environment. But scant attention has been given for a person supervisor fit in research. (Kristof-Brown et al., 2005).

P-G fit - the match between individuals and their workgroups, usually based on a shared psychological compatibility. P-G fit exists when one shares similar or complementary values as those of team members or a person has a work-related KSA (Seong, 2012).

Literature Review

The P-E fit refers to the relationship of compatibility or incompatibility that may exist between a person and the environment. The P-E fit theory has a long history that goes back to 1909 when Pearson first introduced the concept of "congruence" in vocational counselling (Sekiguci, 2004). Since then, the model has been further developed, improved, and expanded by many other scholars to accurately capture and explain how the interaction between personal characteristics and work environment influences each other.

Several P-E fit formulations have been proposed, the most widely known ones those of Dawis and Lofquist (1984); French, Rodgers and Cobb (1974); Levi (1972); McGrath (1976); and Pervin (1967). Contemporary P-E fit research is often traced to Parsons (1909) who developed a matching model to describe the fit between attributes of the person and characteristics of different vocations. Afterward, Murray's need-press model and Lewin's field theory largely contribute for the development of theoretical P-E fit research (Edwards, 2008).

For a long time, P-E fit has been discussed from the two perspectives of supplementary fit and complementary fit (Muchinsky and Monahan, 1987). Supplementary fit usually means that individuals and organizations have similarities in terms of goals, attitudes and values; for example, individuals and organizations deem that autonomy is of greater significance (Kristof, 1996). Complementary fit denotes that the resources owned by the individual or the organization can meet each other's needs; for example, the skills possessed by the individual meet the requirements of the organization, or the resources provided by the organization meet the needs of the individual (Cable and Edwards, 2004). In a complementary fit, an employee adjusts the deficiencies of the organization or adds what is missing in it (Muchinsky & Monahan, 1987). Complementary fit is attained when a person's abilities and skills meet the environment's demands (abilities–demands fit); or when the environment's resources fulfil a person's needs (needs–supplies fit) (Caplan, 1987; Kristof, 1996).

The basic principle of person-environment fit (P-E fit) is based on Lewin's Field theory, which states that an individual's behaviours are the outcome of the interaction between individual and environment (Oh et al., 2014; Milliman et al., 2017). Mathematically, B=f (P, E), where B is behaviour, f is function, P is person and E is environment. Some of the credit for the popularity of fit research comes from its historic roots. Specifically, fit is the manifestation of interactional psychology (Kristof-Brown, Zimmerman, & Johnson, 2005) as well as Lewin's formula for human behavior, $B = f(P, E)$, where B refers to behaviors, which is a result of both the person (P) and the environment (E) (Lewin, 1943). Perhaps due in part to these roots, fit research has become "one of, if not the, dominant conceptual forces in the field" (Schneider, 2001)

The theoretical concept of P-E fit was first proposed by Plato (Kaplan 1950) and further developed by vocational psychologists such as Dawis, Lofquist (Dawis et al. 1964), and Holland (Holland 1959). The concept has its roots in the interactive perspective in psychology (Kaplan 1950), which recognizes that individuals' attitudes and behaviours are determined jointly by their personal characteristics and their environments. In studies of PE fit, persons are operationalized in terms of individual traits such as abilities or preferences. Environments usually refer to some characteristics of a setting such as demands or norms (Yang et al. 2008). The core premise of the PE fit theory is that when individuals and their environments are compatible, their attitudes and behaviours are

likely to be positive (Kristof Brown et al. 2005). In contrast, PE misfit can generate dysfunctional attitudes and behaviours.

Methodology

This research used an embedded mixed method design that combines both quantitative and qualitative approaches, as a process of data collection, interpretation, analysis, and report writing, due to the nature of the interactive person-environment fit and objectives related to task performance.

Population and Sampling

The sample for this study were taken from the two administrative cities of Ethiopia. The sample is designed to provide estimates of task performance and person – environment fit indicators for the two administrative cities as a whole and for each of the two administrative cities separately. The target populations for this study will be employees of civil servants (experts at different levels) of two administrative cities - Addis Ababa and Dire Dawa. The target organizations are government civil service offices – land administration, finance, trade, agriculture, investment offices/Bureaus. First, the sample will be stratified into Addis Ababa and Dire Dawa cities and secondly, the offices categorized into four offices (public relation and good governance; economic sectors; municipal services and social sectors). Based on the number of customers the offices serve and the availability of the offices from both administrative cities the following offices were selected at office level. From public relation and good governance - Public Service and Human Resource Management Bureau selected; from economic sectors - Finance and Economy bureau; Trade, industry and investment Bureau; Agriculture, Water, Mines and Energy Bureau; Land Development and Management Bureau and Road and Transport Bureau selected; from municipal services - Communication Affairs Bureau and city administrative office and from social sectors -Woen's and children's Affairs Bureau; Health Bureau; Education bureau will be selected. Finally, a sample of employees (experts) will be randomly selected to fill the survey questionnaire from the selected civil service sectorial offices/Bureaus.

To generate quantitative data the study will use survey design where samples of respondents will be drawn using appropriate scientific methods. A simple random sampling technique will be used in drawing the representative samples of the research. The nature of the data is cross - sectional whereby data and information will be collected from the field once and from the target civil service public service sectors. To achieve this, standard model questionnaires will be developed from different literature reviews and contextual to our study, along with a written description of why certain questions or sections have been included.

***Sample Size**:* For this survey, a representative sample size must be determined using variables for each objective and then the maximum sample size will be considered. The standard sample size formula is used to estimate the sample size using Cochran (1963) formula: the sample size is determined using population proportion formula with 95% confidence interval, using the following assumptions and parameters: Proportion of task performance on the person- environment fit study considered as 50%, 4.5% margin of error (since there is no study in Ethiopia in this area and so a representative sample has to be selected with minimum margin of error). Hence, the following formula is applied to calculate the sample size. The study plans to provide separate estimates for the cities and therefore the Cochran sample size formula will be multiplied by 2 (Deff).

$$n = Deff * \frac{Z^2\, p(1-p)}{d^2} = 949$$

Where:

n = required sample size

p = proportion of respondents with the population of interest, which is 50%

1-p= the proportion of the remaining population proportion 50%

Z = Confidence limit, which is usually at 95% level or 1.96

d = Margin of error level and usually estimated as 4.5% or 0.045.

Therefore, a sample of 949 employees (experts at different levels) will be selected and asked to fill the standardized self-report questionnaires related to P-E fit and its outcomes.

For the qualitative part, employees (experts) who have at least two years of experience in civil service offices, assumed to provide better information about discussions, will be identified and invited to participate in the specific interviews. Qualitative data generation technique to be used is in-depth interviews (IDIs) or/and key informant interview (KII). Totally 36 IDIs/KIIs (20 from AA and 16 from Dire dawa) from different target civil service offices will be interviewed for the qualitative data collection part.

Methods of data analysis

After the data collection process, the data were analysed using STATA and R software. First, to confirm the dimensionality of the questionnaire and to guarantee that each variable constituted an independent construct, an exploratory factor analysis was conducted. The Cronbach alpha was used to test the reliability of the factors. The spearman correlational were used to see whether any relation exists between the identified factors and the dependent variables. Finally, a structural equation model was used to examine the relationship among person-job (PJ), fit person-organization (PO), fit person-group (PG) fit and person-supervisor (PS) fit, work engagement and job performance. The interpreted qualitative data and the described quantitative data were integrated at the stage of analysis to corroborate the fact generated from both sources.

Inclusion criteria

The study sampled from all existing employees to participate in the survey while data collection. Employees were eligible to complete the survey if they had at least one year of experience and are currently employed and working in civil service offices during the data collection period. These pre-set criteria for participant eligibility were necessary to obtain rich and high-quality data from participants who had familiarized with his/her job, supervisors, groups and the organization behaviours. Setting a baseline of a minimum of 1 year's work experience was an essential requirement as it was considered unlikely that employees with less than a year's experience would be able to speak confidently about his/her job and the organization he/she belongs to.

Results and Discussion

Profiles of the respondents

The Table 1 below presents the detailed profile of the survey respondents. The participants were asked about their demographic information contains gender, marital status, position and highest education level. The sample consists of 55.6 % male and 44.4 % female. Regarding the marital status of the respondents, 64.7 % are married and 31.8 % are single. In terms of the employee position, 46.8 % responded as they are senior expert, 34.1 % middle level expert, 17.9 % junior expert and only 1.2% are manager. Table 1 also shows that most of the respondents have BA/BSc

Degree, which is 65.8%. About 23.6 % of the respondents are MA/MSc and above MA/MSc degree holders and the rest 10.6% are diploma and below diploma holders.

Table.1: Profiles of the respondents

Profiles of the respondents		Count	Column N %
1. Name of Your City	Addis Ababa	595	63.2
	Dire Dawa	347	36.8
	Total	942	100.0
2. Sex	Male	519	55.6
	Female	415	44.4
	Total	934	100.0
4. Marital Status	Single	299	31.8
	Married	608	64.7
	Widowed	8	.9
	Divorced	24	2.6
	Total	939	100.0
6. Your Position in the organization	Manager	11	1.2
	Senior	441	46.8
	Middle level expert	321	34.1
	Junior	169	17.9
	Total	942	100.0
7. What is the highest level of education you have completed?	12th completed	4	.4
	Diploma	95	10.2
	BA/BSc Degree	611	65.8
	MSc/MA Degree and above	219	23.6
	Total	929	100.0

Explanatory factor analysis

To confirm the dimensionality of the questionnaire and to guarantee that each variable constituted an independent construct, an exploratory factor analysis was conducted. To apply explanatory factor analysis, the adequacy of the sample size must check, and method of factor extraction and rotation procedures must be explained. Exploratory factor analysis is a statistical method employed to increase the reliability of the scale by identifying inappropriate items that can be removed and the dimensionality of constructs by examining the existence of relationships between items and factors when the information of the dimensionality is limited. In this study, an exploratory factor analysis was conducted on the 24 items each with seven points Likert scale data from person-job fit, person-organization fit, person-group fit and person-supervisor fit question items with a nonorthogonal direct oblimin delta zero rotation method using SPSS and R software. Research suggests that there is a tendency of people to overclaim their knowledge to maintain a positive self-image and to show their competency to others (Atir et al., 2015). In many behavioural and organization research, it has been noticed that there is a discrepancy between the self-report measure (mostly exaggerated) and the actual measures. Due to these many respondents give a bias response to a self-assessed measure question item. Prior to the analysis, the presence of method variance bias must be tested using Harman's single-factor test. In Harman's single-factor test all variables in the study were entered into an exploratory factor analysis to examine the unrotated factor solution forced the algorithm to extract one factor. If the total variance extracted by one factor exceeds 50%, then there is a common method bias in the study. Table 4.3 shows that the total variance extracted by one factor is 33.5 % and this indicates that there is no substantial amount of common method variance present in the data.

Total Variance Explained						
	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.711	36.296	36.296	8.040	33.501	33.501
2	2.581	10.756	47.052			
Extraction Method: Maximum Likelihood.						

Kaiser-Meyer-Olkin (KMO) and Bartlett's Test

It is mandatory assumption to test and examine the adequacy of the sample and the suitability of data to run factor analysis. Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy test and Bartlett's Test of Sphericity were executed to determine construct validity and to confirm that the data collected for an exploratory factor analysis were appropriate. The KMO test was used to verify the sampling adequacy for the analysis, and Bartlett's Test of Sphericity was used to determine if correlations between items were sufficiently large for explanatory factor analysis.

Table 0.1 presents KMO statistic and Bartlett's Test of Sphericity. The Kaiser (1974) recommends a bare minimum of 0.5 and that values between 0.5 and 0.7 are mediocre, values between 0.7 and 0.8 are good, values between 0.8 and 0.9 are great and values above 0.9 are superb (Hutcheson & Sofroniou, 1999). For these data the KMO value is 0.882, which falls into the range of being great, so the considered sample size is adequate for factor analysis. Bartlett's test of Sphericity (Bartlett 1950) provides a chi-square output value. The test of sphericity indicates a Bartlett's Test of Sphericity chi-square of 4300.225 and P-value=0.000 which is less than a significant value of 0.05. This indicates that the item correlation matrix is not an identity matrix. Both the assumption of sample size and correlation matrix are satisfied, now we can run a factor analysis for the collected data.

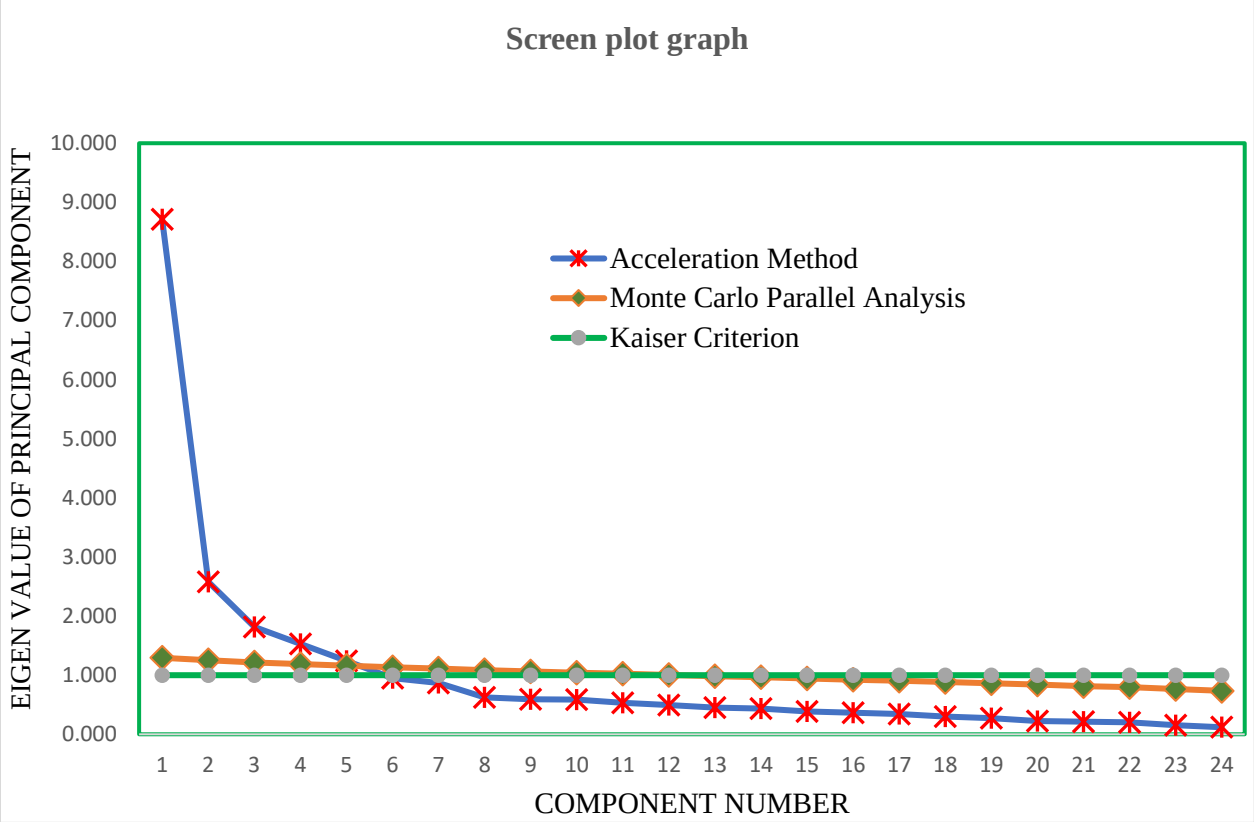
Table.2: KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.889
Bartlett's Test of Sphericity	Approx. Chi-Square	7056.464
	df	276
	Sig.	.000

Factor Extraction and retention

To determine the number of principal components and factors to retain three methods of factor retention method was used. The Kaiser criterion, acceleration method and Monte Carlo parallel analysis was applied. Studies shows that the Parallel analysis is the most accurate and Kaiser criterion is the old and poorest performance measure to determine the desired number of retention factors. Kaiser criterion tends to overestimate and acceleration factor – to underestimate the number of factors/ components. The parallel analysis shows fewer fluctuations in its accuracy and is more robust. To determine the number of factors to retain a screen plot graph was used. The scree plot is a graph of the eigenvalues against all the factors. From screen plot graph it is difficult to determine the exact number of retained factors even if the curve starts flattening on factor between 4 and 5 (graph xxx). Note also that there are 5 factors that has eigenvalue of greater than 1. To determine the retained number of factors further investigation is important.

Figure 1: Screen plot graph



The scree plot depicts that there are five factors that must be retained based on the eigen values greater than one. However, factor 5 contribute only small proportion on the total percentage of the eigen values. As mentioned above, the use of parallel analysis provides further evidence or a basis to decide the number of factors more easily. A parallel analysis is a more rigorous method, in which each eigenvalue (which represents the size of the factor) was compared against an eigenvalue for the corresponding factor in many randomly generated data sets that have the same characteristics as the data being analysed.

Table 0.3 presents the actual data and a simulated Monte Carlo parallel analysis result of the eigen values along with factors. The eigenvalues of the first five factors in the actual data is greater than the corresponding eigen values of the simulative data set. According to parallel analysis method a factor is considered valid if the actual eigenvalue exceeds the eigenvalue generated from the random dataset. The last factor consists of item 8 (My abilities fit the demands of this job), item 9 (I really fit this organisation) and item 10 (I feel that my personal values are a good fit with the value of this organization). These items have no meaningful interpretation related to the study. Therefore, in this research we discard the last factor even if it has an eigen value of greater than 1. At last, the research retained four factors that are important and relevant to the research question under investigation.

Table 04: Eigen Values of the Actual Data and the Monte Carlo Simulative Data

Factors	Actual Data	Monte Carlo parallel analysis Simulative Data
1	8.711	1.29467
2	2.581	1.250406
3	1.814	1.216713
4	1.526	1.186915
5	1.241	1.160252
6	0.952	1.134948

The percentages explained by each factor were 36.3% (factor 1), 10.8% (factor 2), 7.6% (factor 3), and 6.6% (factor 4). These four factors explained about 60.97% of the variance.

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	8.711	36.296	36.296	8.711	36.296	36.296	5.223
2	2.581	10.756	47.052	2.581	10.756	47.052	5.304
3	1.814	7.558	54.610	1.814	7.558	54.610	4.808
4	1.526	6.360	60.971	1.526	6.360	60.971	5.624

Extraction Method: Principal Component Analysis.

a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

Factor analysis result

Finally, the exploratory factor analysis identifies four factors using a principal factor analysis and noblemen rotation matrices identified four-factor structure. Based on the literature, the person-environment fit dimension is proxied by four major dimensions, namely, person-job fit, person-organization fit, person-group fit, and person-supervisor fit. Accordingly, factor 1 is named as person-organization fit, factor 2(person-group fit), factor 3 (person-group fit), and factor 4 (person-supervisor fit). Table 4.5 presents the factor analysis result with the list of the items.

Table 0.5: Factor Analysis Results

Pattern Matrix[a]

	Component			
	PO fit (4 item)	PJ fit (7 item)	PG fit (6 item)	PS fit (4 item)
12. My values match those of current employees in this organization.	.796			
11. My organization meets my major needs well.	.794			
13. I have affections and affinity for this organization.	.748			
14. This organization has the same values as I do about concern for others	.610			
5. I am the right type of person for this type of work.		.815		
2. My job helps me to become the person I want to be.		.793		
4. My motivation for work stems from loving this job.		.757		
3. My job inspired me.		.719		
6. I am passionate about this job.		.665		
7. I want to go to work when I wake up from bed in the morning.		.517		
1. My personality is a good match for this job.		.477		
19. My skills and abilities match the skills and abilities this team			.866	
20. My ability level is comparable to those of my team members			.804	
18. My personality is well suited for the personality or image of this team			.767	
17. My personality is like the team members I work with			.680	
15. Employees of this organization can work in unity.			.559	
16. When making key decisions, my team members will consult me.			.478	
23. My Boss gives me authority to do my job.				.922
24. I can trust my boss to back me up on decisions I make in the field.				.907
22. My Boss is flexible about how I accomplish my job.				.897
21. My manager is supportive of my ideas and ways of getting things done.				.722

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.
a. Rotation converged in 13 iterations.

Test of Reliability: The reliability test was conducted to check whether the respondents' scores on any item statement tend to be related to their scores on the others. According to George and Mallery (2003), Cronbach's (α) value rules of thumb classification states that if $\alpha > 0.9$ – 'Excellent', if α is between 0.8 and 0.9 – 'Good', α between 0.7 and 0.8 – 'Acceptable', α ranging from 0. 6 to 0.7 is 'Questionable', α ranging from 0.5 to 0.6 is 'Poor', and $\alpha < 0.5$ – 'Unacceptable'. Based on this, the Cronbach's alpha for the four indicators of person – environment fit was computed, and the result is indicated in the table below (Table 4.1). As indicated in the Table 0.6, Cronbach's alpha for the four person – environment fit dimensions within the range of good (ranging from 0.8 to 0.9). This is the evidence to conclude the data is reliable.

Table 0.7: Reliability Statistics for person – environment fit

Fit Dimensions/Indicators	N of Items	Cronbach's Alpha
Person-job fit	7	0.847
Person-organization fit	4	0.854
Person-group fit	6	0.856
Person-group fit	4	0.898
Overall	21	0.914

Descriptive statistics and Pearson correlation coefficient

The study focuses on the effect of person-environment fit on work engagement and job performance. In this subsection, we analyze the basic job – environment factors that affect the job performance of the employees by using summary statistics and correlation of variables. As described above, the seven-point Likert-type data is systematically estimated to obtain the mean and correlation for each factor to analyze the Likert scale data quantitatively. The correlation analysis using Pearson's correlation coefficient r was conducted to test for the relationship between the dependent variable - job performance, the mediating variable - work engagement and the independent variables Person-job fit, Person-organization fit, Person-group fit, and Person-group fit. As indicated on the conceptual framework, public servants' performance is broadly determined by organizational and individual factors through attitudinal factors. The person-environment fit dimension is proxied by four major dimensions, namely, person-job fit, person-organization fit, person-group fit, and person-supervisor fit. The seven-point Likert scale captures were used to measure the respondent's self -rated perceptions on their job performance and person environment fit.

The seven-point Likert scale categorized as - strongly disagree (1), disagree (2), Somewhat Disagree (3), Neither Agree nor Disagree (4), Somewhat Agree (5), Agree (6) and Strongly Agree (7) with corresponding codes. Table 4.8 depicts that job performance has a significant and positive relationship with Work engagement, person-job fit, person-organization fit, person-group fit, and person-Supervisor fit (with p-value<0.05). Pair-wise all the fit dimensions are significantly related with other (p-value<0.05). The mean score of the job performance and the person – environment fit for all dimensions are above the average score (average score =3.5).

Table.8: Descriptive statistics and spearman correlation

	Mean	SD	1	2	3	4	5	6
1. Job Performance	5.71	1.29	1	.204**	.296**	.198**	.333**	.300**
2. Work engagement	4.44	1.31	.204**	1	.267**	.270**	.284**	.288**
3. Person-job fit	5.23	1.25	.296**	.267**	1	.460**	.347**	.378**
4. Person-organization fit	5.09	1.39	.198**	.270**	.460**	1	.448**	.433**
5. Person-group fit	5.32	1.16	.333**	.284**	.347**	.448**	1	.473**
6. Person-Supervisor fit	5.20	1.46	.300**	.288**	.378**	.433**	.473**	1

**. Correlation is significant at the 0.01 level (2-tailed).

Structural equation modelling

Structural equation model analysis is conducted to test the hypotheses and to define the direction and magnitude of the effects. The results of the direct effect depict that Person-job fit, Person-group fit, and Person-supervisor fit is significant factor of work engagement (p-value<0.05). This means that work engagement of the employee is not affected due to the employee – organization fit. The direct effect of work engagement, Person-job fit, Person-group fit, and Person-supervisor fit is a significant factor for job performance (p-value<0.05). Similarly, person – organization fit is not a significant factor for job performance of the employee.

Direct effects						
	OIM					
	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
Structural						
Work Engagement						
PJF	.1479635	.0402447	3.68	0.000	.0690854	.2268416
POF	.0620504	.0406269	1.53	0.127	-.0175769	.1416777
PGF	.1620906	.0408243	3.97	0.000	.0820765	.2421048
PSF	.1261783	.0328037	3.85	0.000	.0618842	.1904724
Job performance						
Work Engagement	.0631634	.0329021	1.92	0.055	-.0013234	.1276503
PJF	.199756	.0399554	5.00	0.000	.1214449	.2780672
POF	.0184277	.0400864	0.46	0.646	-.0601403	.0969956
PGF	.1992911	.0405809	4.91	0.000	.1197541	.2788281
PSF	.1025592	.0325908	3.15	0.002	.0386825	.166436
Indirect effects						
	OIM					
	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
Job performance						
Work Engagement	0	(no path)				
PJF	.0093459	.005492	1	.70	0.089	-.0014182 .02011
POF	.0039193	.0032792	1.20	0.232	-.0025078	.0103464
PGF	.0102382	.0059238	1.73	0.084	-.0013722	.0218486
PSF	.0079699	.0046399	1.72	0.086	-.0011241	.0170638
Total effects						
	OIM					
	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
Structural						
Work Engagement						
PJF	.1479635	.0402447	3.68	0.000	.0690854	.2268416
POF	.0620504	.0406269	1.53	0.127	-.0175769	.1416777

PGF	.1620906	.0408243	3.97	0.000	.0820765	.2421048
PSF	.1261783	.0328037	3.85	0.000	.0618842	.1904724
Job performance						
Work Engagement	.0631634	.0329021	1.92	0.055	-.0013234	.1276503
PJF	.2091019	.0397391	5.26	0.000	.1312147	.2869891
POF	.022347	.0401166	0.56	0.577	-.05628	.100974
PGF	.2095293	.0403114	5.20	0.000	.1305203	.2885383
PSF	.1105291	.0323916	3.41	0.001	.0470427	.1740155

Conclusion and Recommendation

Conclusions

This study investigated the relationship between P-E fit, work engagement and task performance in civil service employees. The study applied correlation and structural equation model. The spearman correlation result shows the Person-job fit, Person-organization fit, Person-group fit, and Person-supervisor fit dimensions have a significant and positive relationship with employee work engagement and job performance. The structural equation depicts that civil service employees with higher person-job fit, Person-organization fit, Person-group fit, and Person-supervisor fit dimensions have higher work engagement and higher job performance. Person – organization fit does not affect the work engagement of the employees and job performance.

Recommendations

The study was not without limitations. This study employed a cross-sectional study design. To see the causal effect of person-environment fit on work engagement and job performance, a longitudinal study could have provided superior results. Future studies are recommended to employ longitudinal investigation to achieve superior results on the causality among constructs. The other limitations are the survey is based on self -reported data. There may be an exaggeration of knowledge on the given survey questions of perceptions. This chapter presents recommendation based on the research findings.

- *A match of an individual's knowledge, skills, abilities, and other characteristics with the requirements of a particular job, then the employee will be more engaged in his/her work, and this increase the job performance of the employee. Therefore, civil service office should focus on the person – job fit while recruiting the employee or assign a person that fits his/her jobs.*
- *Civil services office or employee of civil service must give values for teamwork for a greater job performance and work engagement.*
- *Civil service managers should assign or revisit whether the employees fit with their supervisor because the good fit of these leads employee to engage in their work and for a better job performance.*

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3.9. Can Professional Development Intended for Teacher Educators Influence Roles of Academics in Leadership? Lesson from Ethiopian Public Higher Education Institutions (HEIs)

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Abstract

This study aims to evaluate the influence of the professional development program specifically the higher diploma program (HDP) on academic leaders' role in the HEIs of Ethiopia. The study followed a constructivist paradigm and a case study research design. Data were collected using interviews and FGDs. Twelve respondents and four FGD groups participated in the data collection. They were selected using purposive, and proportional sampling. Transcription, coding development, and identification of sub and main themes were performed using NVivo version 10 software. As the findings revealed, the influence of the PD on a leader's role is great. It influenced leaders to exercise managerial functions, improved their leadership quality by facilitating and easing the role of the leader, minimized school problems, and made the staff members discharge their roles. It also influenced teachers to get and share experiences with their colleagues, it influenced both leaders and teachers by developing problem-solving skills, giving feedback, and listening to other's ideas. Therefore, the HEIs should include some contents of leadership in the module.

Keywords: *Influence, higher education, higher diploma program, Academic leaders', Professional development*

Introduction

The HDP is a practical training, which takes one academic year to complete and trainees are expected to carry out their teaching duty alongside the training (Gerbi, 2017) or it is an in-service training (Yadessa, 2019; Gerbi, 2017) conducted using handbooks, which have been revised from time to time (MOE, 2018, p. II). The training will require 60 sessions or 30 weeks and 2 hours per session, which requires a total of 120 hours to engage in the training, at least four hours per week. In addition, it requires 12 hours for school/organization placement. From the time, it was expected that the candidates to engage in 60 hours of independent study, which included additional reading, research, and professional conversations. Candidates spend time in a local school or local organization and complete an action research (classroom-based) project showing that their work for the diploma has a significant impact on their teaching practice. The fieldwork provides the opportunity for participants to improve their teaching and research by testing the application of their knowledge and skills in organizations outside the university system (MOE, 2011). The candidates have professional meetings with the Higher Diploma Leader or Tutor. Successful completion of the HDP has also been instituted as a requirement for all university teachers in public universities (MOE, 2018).

The program intended to enhance the teaching quality of HE, endeavor the university to render quality education, make itself align with the expectations of the HE (Bunkure & Tesema, 2018), and enhance teaching skills (Yadessa, 2019; Gerbi, 2017; MOE, 2008). As a result, the MOE conceived the HDP as a recognized tool for the professionalization of university lecturers who can produce a qualified workforce (Gerbi, 2017). Professionalization of university teachers is meant to enhance the internal quality of universities; and encourage universities to discharge their role of providing need-based and quality education (Bunkure & Tesema, 2018). As it is stated in the HDP training handbook, the program will enable teacher educators to identify their own needs and become professional, reflective teacher educators demonstrating high standards of professional ethics, developing teaching as a skill, based on sound theoretical knowledge and experience. It is also expected from the attendants of the program to role model good practice and contribute to institutional and community development, provide a high-quality learning experience for students, and teachers, be involved in collaborative learning and teamwork work, and address gender issues and social inclusion (MOE, 2011). Therefore, it is imperative for HE teachers to apply the HDP in their teaching-learning context and should discharge the role, which is expected from them for the success of the teaching-learning process.

The success in the teaching-learning process is associated with many issues. Among these, the role of the leader is one. The role the leaders (head departments, college deans, coordinators, directors, and university presidents) play in marshaling resources, managing, directing, and facilitating the environment for the teaching and learning process is great to make the teaching-learning process effective. The most effective programs have well-trained and organized leaders who are improvement-oriented, and sophisticated in their use of data to drive an ongoing continuous improvement process that helps them orient resources effectively toward specific goals (Lieberman, 2017; Mead & Mitchel, 2016; Derrick-Mills, 2015). According to Clifford-swan et al. (2021), the role of leaders appears to be key to the school. They are extremely determined and thoughtful in creating a working environment that encourages intellectual development, motivation to work, and positive working habits (Mansor et al., 2021; Gilavand, 2016); ensuring a safe learning environment (Kemethofer et al., 2022), design effective forms of two-way communications (Alinsunurin, 2020), and play an important role in ensuring and enhancing the quality of schools (Mustapha & Abulfathi, 2019). Because the overall quality and environment of teaching affect how classroom-related concepts are constructed in classrooms (Ahsan, 2018). Therefore, the leader needs to collaborate and make teachers share his/her visions and work towards the achievement of the institutional goal because a passionate active teacher as a leader shares a set of personalities and attitudes with other teachers in schools (Mulovhedzi et al., 2022). They are energetic, risk-takers, whose integrity, high efficacy, and content knowledge give them credibility with their colleagues (Mulovhedziet al., 2022).

In this regard, the HDP will help HEI leaders working at different levels by developing the skills of teachers in managing their teaching-learning process (MOE, 2015). This will minimize the burdens of the leader, facilitate the teaching-learning process, and ultimately contribute to students' achievement and institutional goals. However, the influence of HDP on the role of leaders has yet not investigated. As my experience in HE and the systematic literature review that I have conducted has shown me, the HEIs did not see the influence of the HDP unless they were providing the training. In addition, this study used a pure qualitative technique and tried to see the influence of the HDP from the perspectives of the respondents, which is different from measuring the effectiveness of the program. Therefore, conducting a study on this crucial issue will help to maintain, improve, or devise strategies and fill a gap in the existing literature and body of

knowledge guided by the following research question.

Research Question

What are the influences of HDP on the roles of academic leaders (head departments, college deans, directors, and coordinators) in Public HEIs of Ethiopia?

Literature Review

Various projects/programs offer short-term teacher training courses at different times with different focuses. The HDP is one of the Professional Development (PD) programs developed by the Ministry of Education (MOE) to professionalize university teachers in Ethiopia (TESO, 2003). It is considered an internationally recognized instrument for the professionalization of university teachers that can produce qualified workers (Gerbi, 2017). The program aims to improve the internal quality of universities (Bunkure & Tesema, 2018) and is considered a good training package (Sileshi, 2012) to improve teaching skills (Yadessa, 2019; Gerbi, 2017). The focus is on improving the quality of education in Ethiopia through a licensing program that develops the skills and professionalism of teacher educators and aims to create a reflective teacher capable of applying active learning and student-centered teaching methods (Monroe, n.d.; TESO, 2003). According to Egne et al. (2020), and Melesse and Teshome (2009), the HDP promotes active learning and opens up free interactions between learners and trainers, followed by reflection and feedback. It will help teachers to be more reflective in their professional practice than their untrained peers (Bunkure & Tesema, 2018), and lead to successes in promoting students' academic achievement (Egne et al., 2020). It also develops teachers' awareness and ability to conduct action research to solve educational problems (Aga, 2015).

Our understanding is that when teachers are aware of their responsibilities and assume the responsibility required of them, the role of the leader becomes easier and the burden on leaders is minimized. As we know, the role and contribution of the leader are among the most crucial and determining factors in understanding and leading educational institutions (Chalikiaset al., 2020). Educational leadership refers to influencing others in the educational environment and the need for some type of action to achieve goals. It is the process of attracting and directing the talents and energies of teachers and students to achieve common educational goals (Mahalat et al., 2021) because leadership is an essential factor for a successful institution (Kemethofer et al., 2022). The leader should act as a learning manager to guide teachers in PD (Amtu et al., 2019) and as an inspiration for lifelong learning (Chalikias et al., 2020). They must be agents of change and lead change processes (Chalikias et al., 2020; Romay et al., 2016). To achieve educational change and school development, teachers and leaders need to be appropriately trained, empowered, and aware of their key role in such processes (Contreras, 2016). When leaders share leadership responsibilities and allow teachers to take on leadership roles, the type of collaboration that follows leads to productive social capital, which in turn increases the scope of the professional community (Nappi, 2014).

Leaders should also be decisive and thoughtful in creating a work environment that promotes intellectual development, work motivation, and positive work habits (Mansor et al., 2021). They provide all the necessary facilities in the classroom to create a conducive environment for the overall development of students and to motivate and inspire both teachers and students to teach and learn (Mustapha & Abulfathi, 2019). Therefore, it is very important to use and apply a leadership style that fits and harmonizes with the current teaching-learning process.

In the 21st century, school leadership is crucial in redefining the vision, mission, and goals of the institution (Okilwa & Barnett, 2017). Keeping up with the changing times requires a renewal of educational movements (Ucar & Dalgic, 2021) and the urge to instill new leadership paradigms in students (Okinyi et al., 2015). The educational needs of the 21st century make it essential to re-evaluate the traditional management and leadership models and focus on pedagogical aspects, distributed leadership, participatory development, and professional development of teachers. Pedagogical leadership encompasses these aspects and has proven in educational research to be the most effective model for achieving sustainable improvements in schools. It aims to serve students and their learning process and promote human and PD (Contreras, 2016). It maintains a very important competence of managers, teachers, and administrative staff that allows improving results in educational institutions (Rodriguez et al., 2023). As long as the authorities of educational institutions exercise educational leadership in all administrative and academic activities, there will be better teamwork that allows for achieving institutional goals through efficient educational management (Hugo et al., 2023). There is an important connection between educational leadership and good teaching performance, as leadership plays a primary role in the quality of students' education (Tirado-Calderon et al., 2021). Therefore, this study was based on the pedagogical leadership style.

Methodology

Study Area

The study was conducted in Jimma and Mettu public HEIs of Ethiopia, which includes two public Teachers Training colleges (TTC) and the two public universities of the two towns. Jimma is about 350 KM far from Addis and Mettu is about 615 KM far from Addis, the capital city of Ethiopia. Both Mettu and Jimma towns are found in the southwest part of Ethiopia. They are known by coffee production. Similarly, Jimma University is the center of excellence in teacher education, is considered as a first-generation university, whereas Mettu University is a third-generation university, and has long offered the HDP training under Jimma University's moderation. The two teacher training colleges also work together with these universities. In addition, these HEIs were chosen to facilitate data collection and to be comparable to communicate with different responsible bodies of the study within the given period. To use the limited time and costs effectively, considering the quality of the study, the study focuses on Jimma and Mettu public HEIs.

Research Paradigm and Design

The study used the constructivism paradigm. The paradigm was chosen to capture different perspectives, look at the phenomenon from different angles and highlight the effects that the HDP training brought. The research design used by the researchers was a qualitative case study research design. The case study method is useful when we want to conduct an in-depth study of complex phenomena in a specific context, to study science, develop theories and involvements, and evaluate programs. Therefore, a case study design best suits the purpose of the study.

Participants

The study examined two universities and two colleges of education using purposive sampling. Accordingly, Jimma University, Mettu University, Jimma Teachers Education College, and Mettu Teacher Education College were included in the study. As Creswell (2012; p. 209) suggests for qualitative research “the number may be several, ranging from 1 or 2 to 30 or 40 because of the need to report details about each individual or site, the larger number of cases can become unwieldy and result in superficial perspectives”. Accordingly, four college deans (two from two colleges of education and two from universities) were selected through purposive sampling. Likewise, a

coordinator/director from each of the four HEIs and four head departments of each institution (4 females and 12 males) participated in the study through purposive sampling (6*4=24). Purposive sampling was used to find more reliable data from those who attended the HDP training and knowledgeable about the issue.

Furthermore, seven and nine teachers from Mettu and Jimma universities respectively and four teachers from each teachers' college (4*2=8) participated in the study using proportional sampling to obtain proportional weight representing their institutions, which making a total of twenty-four (24) teachers (18 male and 6 female). In general, forty-eight (48) participants (10 female and 38 male) from the four HEIs who have different fields of study, and certified for HDP training five years ago were included in the study as the study was intended to evaluate the impact.

Data Collection Instrument

The study used both interviews and FGDs to collect the data. In-depth interviews were conducted with four faculty members, four college deans or V/deans, and four coordinators and/or directors serving in various positions at the four institutions. A total of twelve (12) participants (3 each) took part in the interview. The purpose of the interview was to reveal more detailed information, observe respondents' nonverbal behavior, clarify misunderstandings, and adapt to various situations. In addition, 20 teachers and 16 head departments were included in the FGDs (each group has 6–12 members), resulting in a total of 4 FGDs. FGD was used to obtain shared insights and evidence from multiple individuals and to identify and assess the impact of the HDP on different subgroups of a population. To ensure the effectiveness of the data collection process, the study used moderators and co-moderators to provide a free and quiet environment and to control the voices and noises that influence the interview process. Accordingly, they prepared the tape recorder, checked it, adjusted it, and recorded the participants' voices.

Method of Data Analysis

A qualitative method of data analysis was used to analyze the data collected through interviews and FGDs. In addition, transcription, coding development, and identification of sub- and main themes were performed using NVivo version 10 software. Iterative reading of the transcribed audio recordings of interviews and FGDs, as well as both open and axial coding were used during coding and theme development. This holistic analysis of the data was done several times, assigning labels to new themes, which then organized into main themes and sub-themes. Finally, the summary of the data was discussed together. Results were then drawn and discussed.

Methods of Maintaining the Trustworthiness of the Instruments

The study maintained the trustworthiness of the interview and FGD by conducting multiple interviews with 12 people over an extended period to get the clear picture of the impact of the HDP. The study tried to avoid the errors that are likely to occur due to the weakness of the interviewer by giving the opportunity for the interviewee to say out what they feel, perceive, and consider about the impact of the HDP without shy and any tension. During the interview process, the interviewer probed to clarify concepts and try to find out the hidden ideas. The researcher has also given the participants drafts of the study to be reviewed and their voice was also considered. In addition, the researcher crosschecked the interview response with FGDs.

Limitation of the Study

This study only focused on the influence of the HDP on the role of academic leaders and only includes four institutions. As a result, it is difficult to generalize the result. Therefore, other researchers may conduct their study on the influence of the HDP using other dimensions and different leadership styles.

Results and Discussions

The study found that three main themes were identified regarding the impact of HDP on the role of academic leaders. These are the influence of HDP on the leadership functions of the leader, the influence of HDP on supporting the role of the leader, and the influence of HDP on the development of leadership competencies. Each of the main themes is presented as follows.

The Influence of HDP on the Managerial Functions of the Leader

Educational leadership and management are central to the planning and organization of educational institutions. Education management is responsible for the proper functioning of a system in an educational institution that involves others (Mahalat, 2021). Managerial functions of the leader, supporting the role of the leaders, and developing leadership skills. Concerning management functions, most participants believed that the HDP had influenced the role of managers. One of the respondents named Dabal said the following.

> ...the head of the department is obliged to create a course catalog; otherwise, the department can conduct the courses at its discretion. This partly has to do with leadership. …for example, when students go out for fieldwork or practice, the department plan ...the money they need in advance. Because they do not receive HDP training, they are unaware of their responsibilities and do not submit their plan legally. Well-trained HDPs will legalize their plan, and their plan will achieve the goal.

Eliyas, one of the deans, also said:

> Hmmm…I've gained...some...important skills, mostly in planning...and how to organize things. Immm...I also used the hmmm...skills that I hmmm...learned or trained through this program. It's the same when it comes to organizing. …So, when we took these trainings, we just learned how to easily search for resources and organize activities. This enabled us to overcome the organizational problems at our university and in our department.

As Dr. Chemo explained there were large differences in planning between those who received the HDP training and those who did not. He said,

> There is a difference between people who have received HDP training and those who have not received HDP training when it comes to planning and implementing what they plan to do. It's a big difference. Hmmm...that means that the trained HDP makes an indirect contribution to the management of the university and plays an important role in making the administration run smoothly.

In addition, leaders have a critical responsibility for directing, leading, and managing educational resources and time. Educational leadership is the process of attracting and directing the talents and energies of teachers, students, and parents to achieve common educational goals (Mahalat, 2021). High-quality leaders can achieve this influence on the teaching-learning process by setting clear instructions for everyone to follow to support both teaching and learning (Kawar & Jordan, 2012). Concerning this, HDP training played an invaluable role in enabling leaders and teachers to lead, guide, and manage their staff, classrooms, and students toward better student performance. The participants of the FGD of TECNO provided their consent as follows.

> We believe that someone who manages the students well, can also manage the office. So, in this context, we can say that we have benefited from this HDP training. As a leader, we must manage the lecturers who work in the department. At the same time, we also teach... So, the experience we have gained in managing the classrooms could also help us in managing the office. In our opinion, we can say that leadership teaches us how to manage the classroom and students and how we can control the students in many ways. So, if you

have an idea about that, we think it could also impact the management of the office. So, it influences leadership.

As other respondents indicated, the HDP training helped them gain experience in managing various programs and students and share it with their colleagues. It benefited them in managing the class and ensuring a good teacher-student relationship, and it also helped them manage their time appropriately. Concerning this, Dr Chemist said:

> …we got some experience on how to lead some programs. Because… there was an exchange of experiences with colleagues, even with coordinators. The result is that you will hmmm... gain some experience for yourself and your future performance. We may gain experience in how to manage immm...students with different behaviors, different academic backgrounds and knowledge.

As Fu'e2 stated, the HDP training influenced participants to manage and use their time appropriately. This is also supported by Teketel. As he said:

> There are differences between people who have received HDP training and those who have not received HDP training when it comes to making full use of their time. As for me, the HDP helped not only to teach me but also… to manage my time properly.

When leaders share leadership responsibilities and allow teachers to take on leadership roles, the type of collaboration that follows leads to productive social capital, which in turn increases the scope of the professional community (Nappi, 2014). Leaders who are focused not only on results but also on improving quality. It starts with oneself, teachers, school staff, and all related parties to achieve quality and effective education (Nurdianti & Nurdin, 2020). Similarly, As the FGD conducted with MeU showed, the HDP training also helped them improve their leadership skills. Participants said and agreed to the following.

> After attending this HDP training, our leadership quality has almost changed, because leadership is not about giving to others, but about making other leaders, making others more leaders and leaders. In this regard, we believe that after HDP training we have increased the number of managers in our staff.

Moreover, in most cases, educational management is responsible for the proper functioning of a system in an educational institution in which others are involved (Mahalat, 2021). They also follow, supervise, monitor, and evaluate their employees. Concerning this, Dr. Chemo said: "When we took part in this HDP training, at least even if it is not directly about leadership, we learned how to group..., manage, control and hmmm... track the activities of the students". As the participants of the FGD of MTTC agreed and said:

> When we know what the teacher is doing in the classroom, it is easier to guide, supervise, or coach the teacher. Therefore, the person supervising the supervisee must know more about what is going on in the classroom than the person being supervised. In this context, the HDP provides leaders with knowledge about what the teacher does in the classroom.

Supporting this, MTTC participants agreed, saying:

> …Leadership teaches us how to manage the classroom and the students and how we can control the students in many ways. So, if you have the idea, it could also have an impact on the management of the office. So, it influences that leadership.

Fu'e 2 also said that:

> hmmm... the HDP training helped me to get to know my environment, hmmm... to identify and categorize the behavior of existing employees, what I need to focus on, hmmm... in my management, in the way, how I need to give a lot of focus I supported, monitored, controlled and directed the management and it showed me what I can focus more on.

In general, HDP training has led managers to exercise leadership functions. It played an invaluable role in helping teachers plan, organize, lead, guide, and manage their staff, classrooms, and students toward the educational goal. It helped them to gain and share experiences with their colleagues, led them to maintain a good relationship with the learner, and influenced them to manage and use their time appropriately. It also influenced the leaders by improving their leadership skills.

The Influence of HDP on Supporting the Role of the Leaders

As we all know, the role of the manager becomes easier when all responsible parties carry out their responsibilities as expected of them. A passionate, active teacher leader shares a range of personalities and attitudes with other teachers in schools; These teachers are energetic risk-takers whose integrity, high effectiveness, and content knowledge give them credibility among their colleagues (Mulovhedzi et al., 2022), facilitating the role of leaders.

Concerning this Fu'e1, one of the deans best explained it as follows.

> …one of the teaching-learning tasks is class management. Simplifying this class management always means that the level of difficulty associated with class management that applies to the leader becomes easier. If teachers teach their students appropriately, it will hmmm… also facilitate the role of the leader and improve and facilitate the teaching-learning process of the college. Facilitation is one of the main tasks of the leader. That's why it always helps...the leader. When this HDP training corrects classroom management, when the teacher has taken responsibility for the workload that may come to the leader in his/her classroom, he/she has reduced the workload that may come to the leader. Perhaps the teacher bears or shares the leadership burden in this regard. This minimizes the burden on leaders.

Similarly, the college's other dean, Dr. Engineer, elaborated on the case and said:

> Immm... Complaints of any kind, immm... come to my office. ...immm...for example, if there are problems with grading students..., again, immm...the teacher has poor teaching performance, the student's complaint goes here (to the dean's office). In this way, the burden falls on my office and if you see these lecturers, most of them who are accused of these routines have gaps, immm... in their Methodology or their pedagogical aspect. One of them is immm... the lack of HDP training. So, if you know how to deal with students' problems, the case should not have come here. It should have been dealt with and entertained there, and the teacher should have solved the problem or not created the problem in the first place. So, it has an impact on my leadership.

In addition, the HDP made a major contribution to minimizing school problems. The HDP can develop the awareness and ability to conduct action research to solve educational problems (Aga, 2015). As indicated by the FGD participants of the MTTC, the HDP has made them reduce the problem that is likely to arise in the classroom due to the learner's delay in the teaching-learning process. The following is their response.

> ...instead of locking the door behind a student who stays for a minute or two, HDP training has helped us allow latecomers into class and treat them in the classroom in a way that allows students to collaborate with their peers in the classroom. In doing so, The HDP training supported and facilitated the role of managers. If we deny them access to the classroom and expel them from school, they may go out the door and create something outside the college or university and they will face various problems. Therefore, the best

> treatment is to advise them to attend their classes for that time and not to be late the next day, rather than suspending them from school due to time constraints.

Furthermore, teachers and school leaders need to be adequately trained, become aware of their key roles (Contreras, 2016) and fulfill their responsibilities in order to achieve educational change and school development. In this way, the HDP supports HEIs leaders by encouraging teachers to fulfill their responsibilities. As Dabal mentions below, comparatively, those who receive HDP training fulfill their responsibilities while others do not. He said, "…due to the lack of HDP training and the negligence of the untrained, immm... due to lack of attention... there is a weakening of their roles and duties. Since they do not receive HDP training, they are not aware of their responsibilities…". Fu'e1 also said that "…if teachers fulfill their responsibilities and lead their class appropriately, the complaints that may arise from students will be minimized and this will reduce the burden on the leader and facilitate the role of the leader."

As we can see from the above ideas, HDP training has generally positively influenced leaders by making teachers take responsibility for their class and share the role of leader, managing their classroom and problems to minimize in the classroom. Therefore, HDP training has a great impact on supporting the role of managers.

The Influence of HDP in Developing Leadership Skills

Leadership skills are an essential part of the role, regardless of position or experience. It has a significant impact on learners' behavior, performance, preparedness, and readiness to take on various leadership roles (Mulovhedzi et al., 2022). According to Moreno (2022), dealing with disciplinary problems is one of the leadership skills that are critical to strengthening a positive school environment. Accordingly, Diro said, "The HDP training directs me how to… understand student behavior and solve problems in the classroom". Dr. Engineer also said that "HDP training has influenced my classroom management in terms of how I deal with students' complaints and problems…" Similarly, Paul said, "It has helped me a lot in dealing with my students' behavior; before this training, I had a problem. More than what we thought during the bachelor's degree, I still get a very relevant skill from the HDP training and still use it."

In addition, they developed the ability to give and receive feedback and listen to others' ideas. This is best explained by Paul. He said this:

> ...when you make assessments and when you give feedback...there are principles you must follow. ...when giving feedback, comments, and suggestions to others, you must adhere to the sandwich model. …still, I am amusing this model. When commenting on others, you must start with the strengths of the person you are commenting on, and then in the middle of your comment point out what needs to be improved, what each person needs to improve in their activities, in their work. Then when you finally finish... comments or feedback, you only need to cover the good things or strengths of that person that can give that person interest, hope, and encouragement. ...that is, I think what I acquired through the HDP training.

Teketel also said: "I have developed the ability to make comments and have tried to apply the model I received through the HDP in solving various problems and treating people." He further explained and said: "When you discuss with others, you just must listen to others. Listening to others rather than talking to them is crucial. Just being a good listener is immm... a crucial skill, even immm...in leadership and counselling". Similarly, Elias, one of the college's deans, said: "Immm…I have also used those immm…skills that I have learned or trained immm…from the HDP. Therefore, it helped me to immm… handle even my immm…college, immm…my management in general".

In summary, the HDP influenced leaders and teachers by developing and equipping them with problem-solving skills, and the ability to listen to others, and give feedback. It helped them apply the model they have because of the HDP to solve various problems, treat people, listen to others and give feedback.

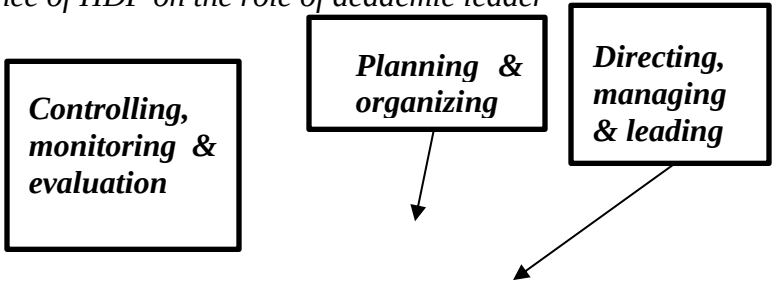
Discussion

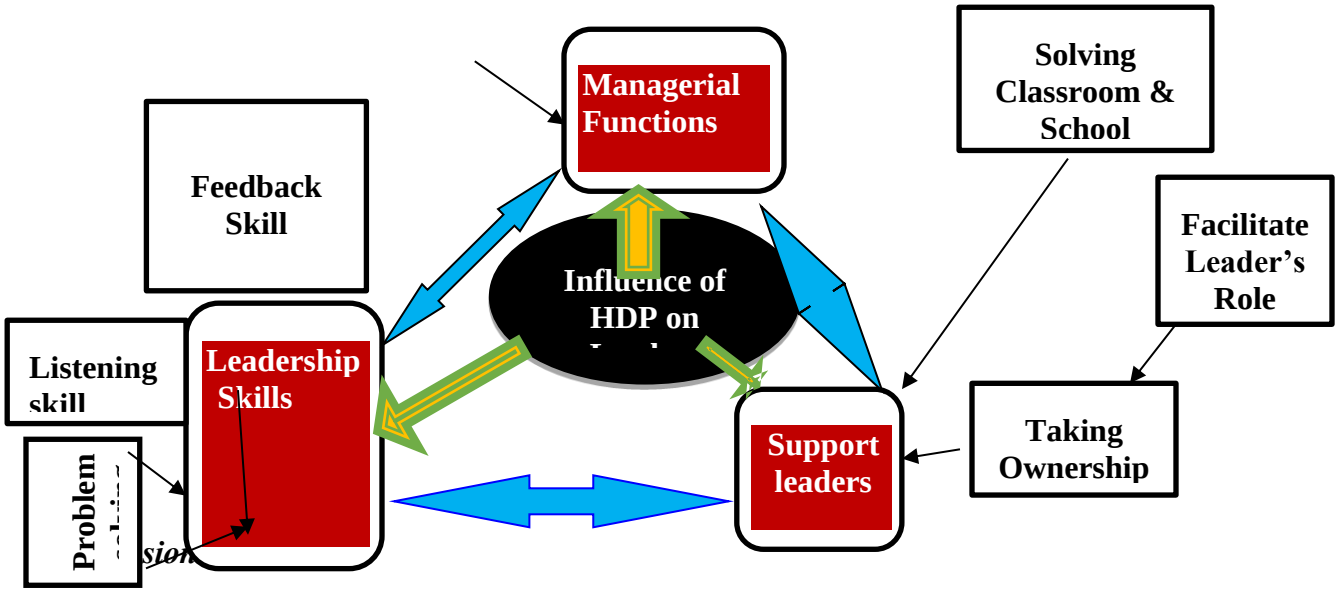
The influence of the HDP as a PD program is great on the role of academic leaders. One of the influences identified in the study was the influence on managers to exercise leadership functions (Mahalat, 2021). Well-trained teachers will prepare and submit their plans and organize and use resources appropriately. However, those who have not received HDP training are unaware of their responsibilities. The HDP as a PD program influenced leaders to lead, guide, and manage their staff, classrooms, and students toward achieving educational goals. The HDP encouraged teachers to gain and share experiences with their colleagues and to build good relationships with learners. It improved the leadership quality of leaders by making them their leaders and producing other leaders to take on their responsibilities. These were supported by various researchers. According to Kawar and Jordan (2012), high-quality leaders can make an impact on the teaching-learning process by setting clear instructions for everyone to support teaching and learning. Nappi (2014) also shows the importance of sharing responsibility and allowing teachers to take on leadership roles to increase the effectiveness of the professional community.

The other impact of the HDP is that it positively influenced leaders by supporting, facilitating, and easing their role. As a result of the HDP training, the school problems were minimized, the staff fulfilled their role, managed their classroom, they took responsibility for their class, solved school and classroom problems by conducting action research, and shared the workload of the class leaders. Since the level of difficulty of class management for the leader has been minimized, leadership becomes easier. This is because a passionate, active teacher as a leader shares a range of personalities and attitudes with other teachers in schools (Mulovhedzi et al., 2022), and the HDP can develop the awareness and ability to conduct action research to solve educational problems (Aga, 2015) and minimize the burden on the manager, which is consistent with the findings of the study.

Next is the influence of the HDP on the development of leadership skills. The HDP will help university leaders by developing university teachers' skills in managing the teaching and learning process (MOE, 2015). It influenced both teachers' and leaders' problem-solving skills, as well as the ability to listen to others and giving feedback. The HDP helped educators apply the sandwich model they have because of the HDP to solve various problems, treat people, listen to others, and give feedback. These results are consistent with those of other researchers. According to Alinsunurin (2020), leadership competencies include leaders designing effective forms of two-way communication and dealing with disciplinary issues (Moreno, 2022). As Egne et al. (2020), pointed out, the HDP promotes active learning and feedback. The following figure summarizes the impact of the HDP on the role of academic leaders in Ethiopia's HEIs.

Fig 1. *The influence of HDP on the role of academic leader*





The HDP as a professional development program has a major influence on the success of the leader. It influenced and supported the role of leadership by encouraging teachers and leaders to apply leadership functions in their teaching and leadership activities. Thanks to the HDP, teachers assume their responsibilities, develop leadership skills, and manage their classrooms appropriately. This minimized school and teaching problems as well as the burden on leaders. Therefore, the HDP has positively influenced the role of leaders and facilitated their leadership activities.

Recommendations

Since the impact of the HDP on the role of higher education leadership is great, universities should include some leadership content in the module, as leadership begins at the individual level and is applied in the classroom and at the institutional level. In addition, the impact of the HDP needs to be evaluated and the HDP training needs to be carried out repeatedly within a period of three to five years to bring teachers up to date and adapt to the changing situation in the education system.

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3.10. The Effect of Performance Management system on Employees' Performance: The Case of Selected Public Sectors of Addis Ababa City Administration

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Abstract

Performance Management System is among the New Public Management (NPM) reform initiatives that has been adopted and implemented in Ethiopia, aiming to bring performance improvement in the public sectors and improving individuals' performance. The study examined the effects of Performance Management System on Employees' Performance in the selected public sectors of Addis Ababa city Administration. A quantitative research approach and descriptive-explanatory design were employed; and primary data were collected from employees, process owners and leaders in the selected sectors. Both descriptive statistics (Mean and Standard deviation) and inferential statistics (regression analysis) were used to see the relationship and predicting ability of performance management system on employees' Performance. The result revealed that components of performance management system i.e goal setting, performance evaluation and reward and amendment exhibited positive and moderate relationship while feedback has strong and positive relationship with Employees' Performance. Moreover, Performance Management System can explain 26.9% of the change in employees' Performance ($P=0.000< \alpha =0.01$). Hence, the sectors should strive to effectively implement Performance Management system to enhance its' contribution in improving employees' performance.

Key-Words: *Employees' Performance, Performance Management System and Public sector*

Introduction

In the "era of Governance by Performance Management (PM), Public sectors are expected to be able to demonstrate its value and to constantly seeks new ways that fosters Performance" (Moynihan (2008:1). Performance Management system (PMS) has become the most critical elements of an organization (Kims & Kang, 2016), and its importance in improving both individual and organizational performance recognized well (Whitford & Coetsee, 2006; Palethorpe, 2011 & Yang et al. 2016). Indeed, the goal of PM is to improve performance and, in so doing, to achieve the objectives (Greener, 2003; Mizrahi et al., 2009; Van Dooren et al., 2010 & Anup & Nikhil, 2021).

Accordingly, organization with viable PMS can enhance employees' and organizations performance. Moreover, a well-defined PMS has a significant effect on employees' performance (Schneier et al., 2013) and organizational performance (Challa et al, 2022). On the other continuum, employees are the vital elements of any organization that should be managed and developed actively, as their performance determines the fate of the organization (Peng, 2007 & Tegene, 2008). Another scholar added that, "People are the "glue" that holds all the other assets, such as financial and physical ones, together and guides their use to better achieves results" (Mathis & Jackson, 2010 cited in Kulla & Soetjipto, 2017). Indeed, it is difficult for an organization to realize its goal without competent and motivated employees' even with perfect plans, a sound organizational structure, and finely tuned control systems, employees' performance makes the real

difference in any organization. In this regard studying the factors which affect the performance of employees is crucial.

Undertaking the importance of public sectors and their influence on the day-to-day activities of citizens, studying the factors that determine the overall organizational performance of the sector is very crucial (Kassahun, 2012, cited in Challa et al, 2022). Besides, understanding the effect of PMS on performance particularly employees' performance is important and value-adding apart from other driving factors of performance. In relation to this, the study focused on four important sectors (Land Management and Development, Vital Event registration, Government Revenue, and public service and Human resource development Office) which are expected to provide service to the citizen and employees but criticized by their poor Performance. Hence, employees' Performance determine their day-to-day service provision (service performance) and undertaking studies on how PMS contribute or affect their employees' Performance can give insight to stakeholders to work on the system. Moreover, research studies on the effect of PMS on employees' performance are limited; most research focuses on the practice and design of PM (Gao, 2015), the link between Performance appraisal and employees' performance(Trsit, 2018), Even, more studies were undertaken in private sectors (different industry); the effects of PMS on Teachers' efficiency in private school (Shahid, et al., 2014), the impact of PM on employees' and organizational performance in Tanzania private sector(Samwel, 2018). In the context of Ethiopia, research studies have been undertaken regarding Performance Management in different context and scope; the practice and Challenges of Performance Management system in Commercial Bank of Ethiopia (Abdurezak& Tigist ,2019), the effect of Performance Management practice on Employees' Performance in Jimma public institutions(Bedassa & Shimelis 2021), the effect of Performance Management System in Organizational Performance in selected sectors of Federal Bureau (Challa et al. ,2022).

On the other continuum, a mixed result evidenced in the relationship between Performance Management and Employees' Performance; positive but insignificant relationship (Zhang, 2012); a significant positive relationship (Samwel, 2018; Okeke et al., 2019) and a moderate and positive effect (Abdulai, 2019). Since, Performance of public sectors really impacts the day-to-day activities of the citizen; and improving Employees Performance contribute to realize the overall objectives of public sectors via enhancing organizational performance, much more research work is needed (Hodgkinson et al., 2017, cited in Challa et al., 2022) to clearly understand the link between PM and Performance. Hence, the current study can provide an additional insight on the relationship between components of PMS and EP in addition to examining the predicting effect of Performance Management System (PMS) on Employees' Performance (EP) in the context of Addis Ababa city Administration. The outputs of the study can be addition to the existing knowledge of PM.

The remaining part of the article comprises a summary of the theoretical and empirical literature on Performance, PM and employees' performance, research methods, result and discussion, and conclusion.

Literature Review

Theoretical Literature Review

Performance and Performance Management

Various Scholars (Armstrong & Baron, 2002; Chan, 2006; Armstrong, 2009 and Yang et al. 2016, DeNisi & Murphy, 2017) in the field viewed Performance Management (PM) as a way of improving Performance. Performance is the combination of all efforts, may be physical or mental or both, carried out by an individual that can go and fit somewhere in the bigger picture, might it

be a team's collective performance, an organizational output, or a whole societal development (Armstrong, 2009). Moreover, Performance refers to the level of success or achievement of employees during a specified period in undertaking tasks against work standards, targets or predefined criteria that have been mutually agreed upon. (Al Mehrzim & Singh, 2016). On the other hand, PM focuses on the entire activities undertaken to improve the overall performance of the organization including each employee and group performance in the organization (Yang et al. 2016). Similarly, Baron & Armstrong (1998) operationalized PM, as a 'strategic and integrated approach' to bring continued success to the organizations via enhancing the 'performance of the employees in the organization and capacitating teams and individual contributors while Performance is about doing the job and the results achieved from that work (Armstrong & Baron,2002).

According to Moynihan (2008:5 cited in Cepiku, 2016), PM is "a system that generates performance information via strategic planning and performance measurement practices and that provides this information to influence a range of possible decisions". Chan viewed PM, as a "strategy for improving employee performance, productivity, and effectiveness (2006: 149). With this, the main purpose of PM is to 'transform the raw potential of human resource into performance' by eliminating intermediate barriers as well as motivating employees (kandula, 2006). Moreover, the essence of PM is capacitating and effectively managing the human elements of an organization (Cabrera & Banache, 1999, cited in Ahmad, 2012), to enhance organizational performance (Buchner, 2007) and effectiveness (Cardy, 2004, cited in Gruman & Saks, 2011). As advocated by Muhammad et al. (2013), a successful Performance management system (PMS) can facilitate to attain organizational goals via employee performance; PMS focuses to improve the effectiveness and efficiency of the employee (DeNisi & Murphy, 2017). PMS can deeply enhance employees' performance, behavior and skills (Taylor & Peirce, 2019). Hence, having the right PMS is a concern of every organization because it is an important driver to be a front-runner in the industry by evaluating and developing employees' performance to get enhanced organizational success.

Performance Management Theories

Performance management theories are an important part of organizational behavior which helps to enhance employees' performance and productivity with motivation and development. Among these theories, goal setting theory, control theory, and social cognitive theory discussed under to provide little insight how PM (components) and Employees' performance are related.

Goal setting Theory

Based on Latham and Locke(1979) Goal theory, goal setting affects employee Performance in four ways; direct attention to priorities, stimulate effort; challenge people to bring their knowledge and skills to increase their chance of success; and employees are willing to unleash their potential to the fullest if goals are more challenging In short, "goal theory promotes the emphasis in performance management on setting and agreeing on objectives against which performance can be measured and managed". In general, the theory focuses on the important relationship between goal and Performance. The goal setting theory starts with simply setting performance goal motivate and inspire employee to focus on achieving predetermined goals.

Control Theory

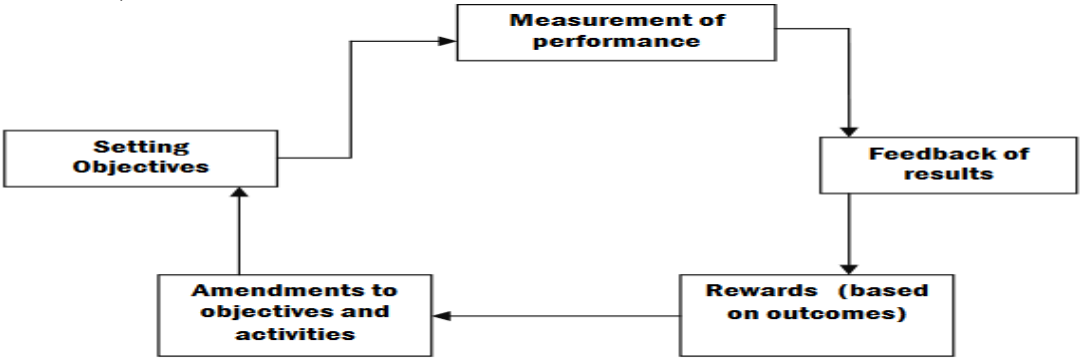
Control theory focuses attention on feedback as a means of shaping behavior. As people receive feedback on their behavior, they appreciate the discrepancy between what they are doing and what they are expected to do and take corrective action to overcome the discrepancy. Feedback is recognized as a crucial part of performance management cycle (UK Essay, 2018).

Social cognitive Theory

Social cognitive theory was developed by Bandura (1986 cited in 2018). It is based on his central concept of self-efficacy. This suggests that what people believe they can or cannot do powerfully impacts on their performance. Developing and strengthening positive self-belief in employees is therefore an important performance management objective (Armstrong, 2009).

The model for performance Management system exhibited how the system should be implemented while there is no single model universally agreed upon. Mabey et al. (1999 cited in Fatile, 2014), have prescribed the model of PMS in the form of 'performance management cycle'. This implied that PMS constituted by five major components: goal setting, performance measurement or evaluation, feedback, reward and amendment. Similarly, Agere and Jorm (2000) also identifies PMS components and prescribed public sectors to establish clear goals, measure indicators, report this information and, link this information to strategic decisions (reward, training provision etc.) aimed at improving performance. Moreover, McDavid & Hawthorn (2005) underscored that PM cycle begins with setting clear and commonly agreed upon objectives, measure performance based on predefined objectives then provide feedback based on result, reward outcomes and finally work to improve performance. Itika (2011) also comes up with a Model of PMS cycle which constituted by performance Planning, performance execution, Performance assessment; and reward and development; understanding the mission and vision taken as a pre-request activity. On the other hand, a model by Bredrup (1995), indicated that PM constituted by three main processes i.e. Performance Planning, improving and reviewing. Finally, the study adopted Mabey et al. (1999 cited in Fatile, 2014) model of PMS cycle.

Fig1. Performance Management System Cycle (Adapted from Mabey et al., 1999:93, cited in Fatile, 2014).



Performance Management in the Public sector

Due to the ever-growing demands of the modern society and failure of the old administrative model, public sectors face various challenges and pressures to provide quality service. To tackle the challenges, public administration has been undergone through different reform**,** New Public Management (NPM) movement was among the reform initiatives. NPM reform initiatives hugely dictated by private sector ethos and corporate sector techniques to shape public sector practices (Sharif, 2002; Edigheji, 2008 cited in Solomon, 2013). In relation, PMS, as key components of NPM, have been adopted and implemented in public sectors worldwide to address concerns regarding performance in the public Sector (Ma, 2017).

Organization with viable PMS can enhance performance of employees' and the overall organizations performance. Moreover, a well-defined PMS has a significant effect on employee performance (Schneier et al. 2013; Makeri, 2014) and organizational performance (Challa et al,

2022). Though, public sectors are eager to enjoy the benefits of utilizing PMS, they fail to properly adopt and implement the system. Janes (2018) also confirmed, public sectors are struggling to move beyond the adoption of performance measurement and management to create more robust performance management systems for higher levels of accountability and transparency.

Regarding African public sectors, Fatile (2014) noted that, PM has been adopted and implemented with the purpose of monitoring, reviewing, assessing performance and acknowledging good performance but the expected result was not achieved. Mbore & Cheruiyot (2017) also added, African public sectors are failed to introduce and implement results-based management system properly. Hence, Public sectors are still unsuccessful regardless of their efforts which impact the contribution of PMS in employees' performance. Likewise, reform implementation has not brought what is expected in the public sectors of Ethiopia (Getachew& Richard, 2007), though the government adopted and implemented with the grand objectives of transforming the civil service through addressing the key challenges that hinder the performance of the civil service and improving overall performance (MOCS, 2013).

Employee Performance

Employees are key resources of the firm to be actively managed and developed, as their performance determines the fate of the organization (Peng, 2007 and Tegene, 2008). Mathis & Jackson (2010) added that, People are the "glue" that holds all the other assets, such as financial and physical ones, together and guides their use to better achieve results. Indeed, it is difficult for an organization to realize its goal without competent and motivated employees' even with perfect plans, a sound organizational structure and finely tuned control systems, employees' performance make the real differences in any organization. (Peng, 2007 & Tegene, 2008). Accordingly, managing and improving performance gain a paramount importance both in private and public sector organization especially in this dynamic era.

According to Daft (2000), employee performance is the ability of employees to carry out a task or achieve the objective. In relation to this employee performance at work refers to the productivity of employees at work and constituted with various employees' behaviors and actions contributed to the achievement of goal (Bernards, 2011; Shmailan, 2016). It is the most important elements of any organization as it determines the success and failure; effective employee performance is a key to the overall success of an organization. Bernards (2011) provides a framework for employees' work performance which incorporates four dimensions of behaviors and action of employee at work i.e. Task performance, contextual performance, counter productive work performance and adaptive performance.

Task performance refers to the ability of employee to perform task central to their job or responsibilities. This includes the ability of employee in planning and organizing work, Prioritizing, being result oriented and focus on work efficiency and quality.

Contextual performance refers to the behavior of employees which facilitate to perform the central job, the behavior supports organizational, social and environmental. This dimension includes behaviors like 'taking initiative', 'accepting and learning from feedback', 'cooperating with others', 'adequately expressing ideas and intentions'

Adaptive performance refers to the ability of employee in adapting to changes (change in work environment or work rules). It includes Coming up with creative solutions to novel, difficult problems Keeping job knowledge up to date, keeping job skills up to date, dealing with uncertain and unpredictable work situations, adjusting work goals when necessary able to deal with stress, difficult situations and adversities.

Counterproductive work behavior refers to behavior that is destructive to the wellbeing of the organization. It includes excessive negativity, making problems bigger than they are, doing things that are harm the organization (e.g. not following rules, discussing confidential information), doing things that harm your co- workers or supervisors (Bernards, 2011).

The Effects of PM on Employees' Performance

Performance management theories such as goal setting theory, expectancy theory and control theory revealed how performance management system cycle affect employees' performance positively, if implemented well. Performance Management (PM) is viewed as a way of improving Performance (Armstrong & Baron, 2002; Chan, 2006; Armstrong, 2009 and Yang et al. 2016, DeNisi & Murphy, 2017). It is a strategy for improving employees' performance, productivity, and effectiveness whereas employees' performance is the ability of employees to achieve objectives. It is through employees' performance that organization performance can be realized. Congruently, a positive and significant effect of PMS on Employees' performance was evidenced (Israr. & Haq, 2014 and Bedassa & Shimelis 2021) and expected from the study.

Empirical Literature Review

A study by Israr. & Haq (2014), examine the effects of Performance management system on Teacher's efficiency in private school by employing a Pearson correlation and regression analysis techniques and the results indicated that, performance management system significantly and positively affect teachers' efficiency. Besides, the study indicated the relative importance of performance management component in explaining Teacher's efficiency.

Another study by Samwel (2018), explore the impact of performance management on employees' and organizational performance in Tanzania private sector. A cross-sectional survey design with quantitative research approach and simple linear regression analysis techniques adopted. Finally, the finding confirmed that there is a significant relationship between performance management and employee performance, and performance management and organization performance in Tanzania private sector.

Mborea & Cheruiyot (2017) study Employees' Performance Measurement and Management in the African Public Sectors. The result revealed that, African public sectors failed to introduce and implement results-based management properly hence public sectors are still unsuccessful regardless of their efforts.

Evidence revealed that various research studies have been undertaken by Ethiopian scholars and practitioners regarding Performance Management in different context such as Banking industry, private sectors, NGOs, Universities, local government and other. For instance, descriptive research by Abdulrazak& Tigist (2019), examine the practice and challenges of Employee performance Management system in Commercial Bank of Ethiopia. 136 participants were selected as a sample with stratified random sampling techniques. Finally, the research came up with a mixed result regarding the practice PMS. Besides, Bedassa & Shimelis undertake a study in Jimma public institutions in 2021. The study examined the effect of PM practice on Employees' performance with quantitative research approach and descriptive research design; and 207 employees were participated in the study. The result confirmed that performance planning; performance training, performance appraisal, performance reward, and performance feedback have a positive relationship with employees Performance. Besides, the result affirmed that Performance training and feedback has a significant relationship with employees' performance.

In the same vein, Challa et al. (2022) conducted research in 2022 on Result Oriented Performance Management and organization performance. The primary aim was to empirically assess the effect of performance management on organization performance in selected federal Bureaus of Ethiopia.

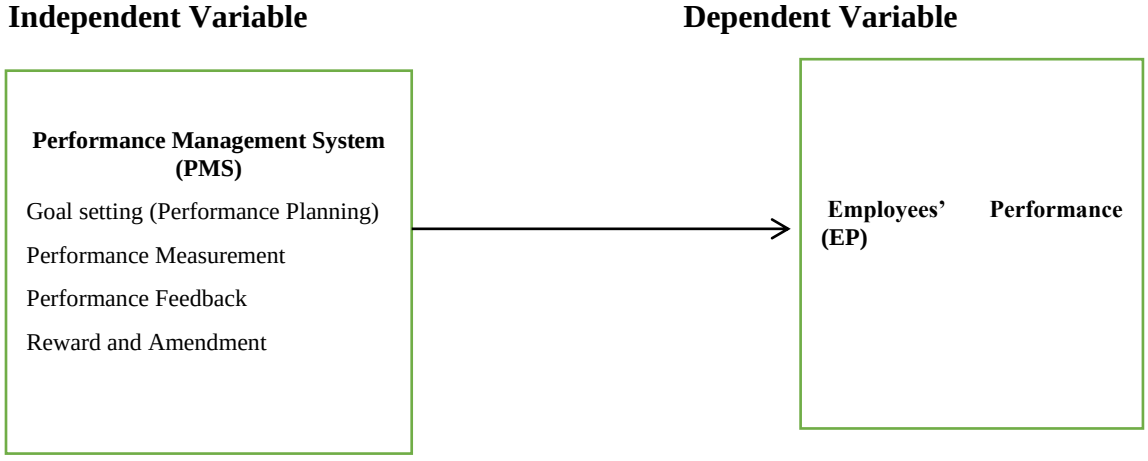
The study employed multiple regression analysis techniques to see the effect of components of Performance Management (participation in target setting, performance indicator quality, evaluation of organizational performance, use of performance information, performance-based reward, and performance-based accountability) on organizational performance. The finding indicated that, overall performance management has a positive influence on organizational performance. This study also found components of performance management process i.e goal setting, performance measurement, feedback and reward have significant effect on performance. The authors prefer to examine the effect of PM on organization performance. Besides, the focus of the study was only on selected federal Bureau of Ethiopia.

Generally, the empirical review indicated that though research has been done in Performance management and Employees' Performance, most research focus on a single context, focus on performance appraisal, focus on the practice and the challenges of PM. Besides, limited studies were undertaken in the selected sectors (land, revenue, vital event registration and public service and Human resource development) which hugely criticized due to their performance. Hence, the study provides insight how PMS link and affect employees' Performance in the selected research area.

Conceptual Framework

Based on theoretical and empirical literature review, the researcher came up with the study conceptual framework. Accordingly, Performance Management system (PMS) identified as a major independent variable constituted by objective setting, performance measurement, feedback and reward (Mabey et al., 1999 cited in Fatile, 2014) who prescribed the model of PMS in the form of 'Performance management cycle'. The dependent variable, employees' performance (EP) measured and constituted by task performance, adaptive performance, contextual performance and counterproductive performance (Bernards, 2011).

Fig2. Conceptual framework of the study



Source: Own design (2022) Developed based on review of Literatures

Methodology

Research Approach and Design

To determine the effect of Performance Management system on Employees' performance, the study employed descriptive-explanatory survey design and quantitative research approach.

Target Population

The study target populations comprise leaders, directors, process owners, team leaders and employees of Land development and Management office, Government Revenue office and Vital Event and Registration offices, and Public Service and Human resource development office in Addis Ababa city Administration.

Sampling Techniques and Sample size Determination

Both probability and non-probability sampling techniques were employed to select sample. First the researcher employed purposive sampling techniques to select sample sectors (land Development and Management office, Government Revenue office and Vital Event and Registration offices and public service and Human resource development office) and then four sub-cities (Yeka, kolfe, Bole and Lideta) were selected randomly from eleven sub-cities of Addis Ababa city Administration. Finally, participants were selected with simple random sampling techniques from the selected four sectors with in the four sub-cities.

The sample size was determined by the finite population correction factor formula, $n = \frac{Z^2 P(1-P)D}{E^2}$. Therefore, 678 employees were taken as a sample in the study.

Where the notations are:

- *Z= the Z value (or Z-score) that is the corresponding value for anticipated confidence level. Recommended value of Z-score for social rating is 1.96 to give a confidence level of 95%.*
- *P = anticipated proportion that have been measured from the whole population to make sure that the sample is representative. With reference to sampling for the social rating tool in various outreach studies turned out to be 33%; in estimating a minimal sample size the recommended P value is 0.33. (Levine et al., 2005)*
- *D= design effect, it reflects the sample design error with D. We deploy three-Stage sampling techniques for this assignment: in the first stage, we select sectors; in the second stage we select sub-cities, third stage we select individual respondents. Hence, our value for the notation D (Design Error) is 3.*
- *E=precision (or margin of error). In most social scales & statistical studies E is kept at 5%.*

Data and Data collection Instrument

About the instrument of data collection, structured questionnaires with five-point likert scale were designed based on the research objectives. The questionnaire comprises five parts; the first part includes the general instruction; the second part focus on respondent demographic profile whereas third section include issues directly related to PMS cycle which also constituted by four construct i.e. goal setting, Performance measurement, feedback , reward and amendment; and the last section includes questions related to employees performance constituted by Task performance, contextual Performance, counterproductive and adaptive Performance. Questions related to Employees' performance adopted with little modification Then, questionnaire was translated in Amharic language to make it appropriate and convenient for respondent and to get reliable data.

Furthermore, 30 questionnaires were disseminated to test the reliability and Cronbach's Alpha values for major constructs were calculated. The result indicated that all constructs have Cronbach's Alpha value greater than 0.7. George & Mallery suggested that Cronbach's alpha values 0.9 or higher indicate excellent reliability, values ranging from 0.8 to 0.89 indicate good reliability, values ranging from 0.70 to .79 indicate acceptable reliability, values ranging from 0.6 to .69 indicate questionable reliability, values ranging from 0.5 to 0.59 indicate poor reliability, and values less than 0.5 indicate unacceptable reliability. Hence, Cronbach's Alpha value of the constructs (goal setting=0.86, performance measures= 0.75, feedback = 8.4 and reward=0.94) are

above the range of acceptable reliability. Besides, based on the input from the pilot test little modification were made on questionnaire which ensure its validity.

Prior to the real data collection and dissemination of questionnaires, the researcher visited each study area and communicate with the leaders of the selected sectors to get permission and facilitation during the data collection. Four data collectors were appointed for dissemination and collection of questionnaires i.e. one data collector assigned for one sub-city (four sectors). As the research sites are four sectors i.e. Land development and Management office, Government revenue, vital event registration office and Ppublicservice and Human resource Development office in four sub-cities (kolfe, Lideta, Yeka and Bole). All the necessary support and supervision for the data collectors were provided by the researcher throughout the data collection period. This ensures the quality and reliability of data obtained from the fieldwork.

Finally, inappropriately completed questionnaires discarded from the onset and about 622 questionnaires were found valid for the analysis out of 678 questionnaires.

3Methods of Data Analysis

Both descriptive and inferential statistical analysis techniques were used for analysis purpose. First, the data collected via questionnaire were encoded into Statistical Software for social science (SPSS). Then simple statistics like percentage, mean, weighted mean and standard deviation were used. Finally, simple regression analysis techniques were employed to test the predicting ability of independent Variables i.e. on components of PMS (goal setting, performance measures, feedback and reward on dependent variables. (employees' performance); simple regression model: $Y = \beta 0 + \beta x + e$

Regression question for the study; $EP = \beta 0 + \beta PMS + e$

Where Y =Predicted value i.e. Employees' Performance

$\beta 0$= the value of Y when other parameter set to zero(Y-intercept), βx= the regression coefficient (β) of the independent Variable (PMS) and e= model error

Result and Discussion

Demographic Profiles of the Respondent

To get the required data, 678 questionnaires were disseminated in the selected sectors and four sub-cities of Addis Ababa city and 622 found valid. Hence, the response rate is 91%.

The pi-chart above depicted that 363 (59.1%) Male, and 251(40.9%) Females were participated in the study. Regarding respondents' age distribution, the above bar-graph portrayed that from the total respondents, 185(35.2%), 290(55.1%), and 51(9.7%) of respondent fall between the age group 22 to 30, 31 to 40 and 41 to 50 years respectively while 96(15.4%) of the participant fail to indicate their age. From the data, we can deduce that more than half of the respondents age fall under the age group 31 to 40. Similarly, a Pi-chart below depicted that out of 622 respondents, 320 are married, 268 are single, 13 are divorced and 9 are widow.

The Table comprises information on respondent education level and work experience. Regarding education, 306 participants which represent 50.1% of the respondent have university degree, 199(32.6%) of the respondents have second degree and 67(11%) have third degree and 39(6.4%) possess diploma as the highest education level they attended. Thus, majority of the study participants have university degree. Similarly, from the total respondent, 144(23.4%), 227(36.9%), 138(22.4%), and 107(17.4%) have a work experience 'five years and below years, 6 to less than

11 years, 11 to15 and above 15 years. The result revealed that 75% of (472) the respondent has adequate experience (above five years).

Table1: Respondents education and work experience

Education Status	Diploma	39	6.3	6.4	6.4
	First Degree	306	49.2	50.1	56.5
	Second Degree	199	32.0	32.6	89.0
	Third Degree	67	10.8	11.0	100.0
	Total	622	98.2	100.0	
Work Experience	less than or equal to 5 years	144	23.2	23.4	23.4
	6 to less than 11 years	227	36.5	36.9	60.2
	11 to 15 years	138	22.2	22.4	82.6
	above 15 years	107	17.2	17.4	100.0
	Total	622	100.0		

Source: Survey Data, December 2022

Descriptive Statistics for Performance Management and Employees' Performance

Table 2: Descriptive Statistics

Variables	N	Minimum	Maximum	Mean	Std. Deviation
Goal setting	594	1.00	5.00	3.5084	.82606
Performance Evaluation	588	1.00	5.00	3.2609	.71655
Feedback	586	1.00	5.00	3.0849	.80943
Reward and amendment	599	1.00	5.00	3.0918	.88407
Employees' erformance	538	1.25	5.00	3.4402	.55746
Valid N (listwise)	488				

Source: SPSS output (2023)

The Table2 presented descriptive result including Mean, Standard deviation, minimum and maximum number of observations of major construct and the dependent Variables; and the result revealed that the mean value of the elements of PMS including the dependent variables fall within the minimum and maximum value which reflects a good level of consistency. Moreover, all the three construct of independent variable (PMS) having an average mean score value equal 3.287; goal setting (**Mean score=3.508 & SD=0.826) and Employees**' Performance **(Mean score=3.44 & SD=0. 557**) which is near to agreement response **(4)** while performance evaluation (**Mean score=3.261 & SD=0. 7166), feedback (3.085 & SD=0.809),** reward and amendment **(Mean score=3.09& SD=0. 884)** have a mean score near to undecided response (3). Hence, the mean value indicated that majority of the respondent unable to decide on the existence of proper performance measurement, feedback and reward mechanisms in the selected sectors of Addis Ababa city Administration.

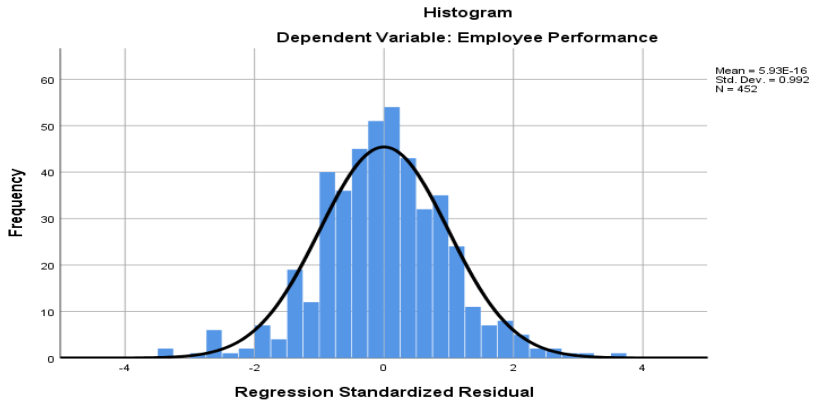
Assumption checking for simple Regression

Table3. Correlation Matrix

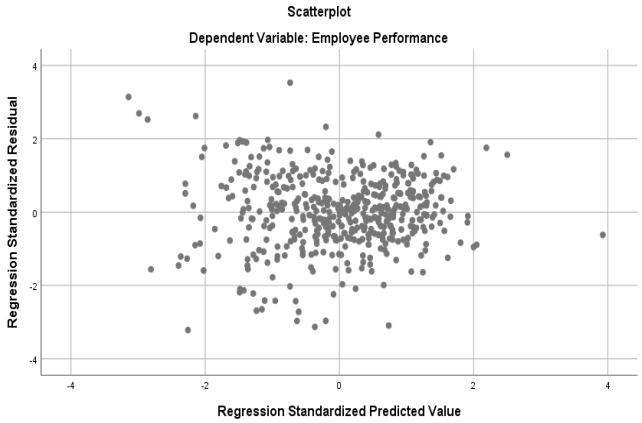
		EP	Age	DF	DD	SDD	TDD	5YD	6 to 10D	11 to 15 D	GS	EE	FB
Pearson Correlation	Employee Performance (EP)	1.000											
	Age	.045	1.000										
	Dummy for Female (DF)	-.006	-.023	1.000									
	Degree Dummy (DD)	.070	.052	.265	1.000								
	2nd Degree Dummy (SDD)	-.053	-.063	.178	-.792	1.000							

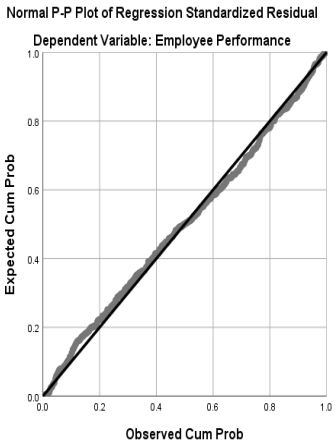
	Third Degree Dummy (TDD)	-.024	.019	.128	-.294	-.351	1.000						
	Less than 5Yrs dummy(5YD)	-.001	-.012	.045	.062	.035	-.149	1.000					
	6 to 10Yrs dummy (5 to 10D)	-.034	-.047	.001	.050	-.067	.027	-.562	1.000				
	11 to 15 dummy (11 to 15D)	.040	.065	-.045	-.118	.041	.116	-.346	-.582	1.000			
	Goal setting (GS)	.464	.030	.002	-.116	.104	.015	-.066	-.001	.065	1.000		
	Performance Evaluation (PE)	.422	.013	.041	-.019	.001	.027	-.019	-.032	.055	.613	1.000	
	Feedback (FD)	.508	.032	.062	-.048	.039	.012	.009	-.018	.011	.643	.644	1.000
	Reward and Amendment (RA)	.445	.011	.102	.050	-.043	-.010	.068	-.086	.030	.480	.456	.707
Sig. (1-tailed) N=488	Employee Performance (EP)	.											
	Age	.199	.										
	Dummy for Female (DF)	.457	.332	.									
	Degree Dummy (DD)	.092	.159	.000	.								
	second DegreeDummy (SDD)	.155	.113	.000	.000	.							
	third Degree Dummy (TDD)	.327	.358	.007	.000	.000	.						
	lessthan 5Yrs dummy(5YD)	.490	.411	.195	.121	.253	.002	.					
	6 to 10Yrs dummy (5 to 10D)	.259	.187	.495	.169	.102	.303	.000	.				
	11 to 15 dummy (11 to 15D)	.224	.109	.195	.012	.216	.014	.000	.000	.			
	Goal setting (GS)	.000	.286	.486	.013	.024	.384	.106	.495	.108	.		
	Performance Evaluation (PE)	.000	.402	.215	.360	.491	.303	.360	.271	.148	.000	.	
	Feedback (FD)	.000	.270	.119	.182	.230	.407	.433	.369	.415	.000	.000	.
	Reward and Amendment (RA)	.000	.420	.026	.171	.208	.427	.098	.051	.281	.000	.000	.000

Linearity and Homoscedasticity



The above graph presented the frequency distribution of the standardized residuals compared to a Normal distribution, the normality curve indicated that many of the residuals are close. Moreover, the histogram is bell shaped which led to infer that the residuals are normally distributed. Thus, no violations of the assumption normally distributed error term.





Graph: Scatter plot Graph: Normal P-P Plot

The assumption of homoscedasticity examined by plotting predicted value and residuals in the scatter plot. Homoscedasticity refers to whether the residuals are equally distributed or tend to bunch together at some values or spread far apart at other values. From the scatter plot presented below, the point in the plot shows almost equally distributed above and below zero on the X-axis, and to the left and right of zero on the Y-axis. This implies that data satisfies the assumption of homoscedasticity.

Residuals are the difference between the observed value of dependent variables and the predicted value. The points in the P-P plot follows almost the straight line drawn from bottom left to the right top, the point which followed the straight line indicated that residuals have a linear relationship with the predicted dependent variables. Hence, the data satisfies linearity assumption. Based on the examination of the information presented above, there is no significant violation of the assumptions of multiple linear regressions.

Relationship between Performance Management System and Employees' Performance According to Chon (1988), Pearson Correlation Coefficient (PCC) is a statistical measure calculating the linear relationship between two variables in a model and used as an estimation of the entire population. Based on his analysis, Correlation coefficient(r) equal to 1 or -1 reflects strong

correlation and r=0 means there is no correlation. Besides, the correlation coefficient within the domain of r= 0.10 to 0.29 weak relationship, r =0.30 to 0.49 moderate relationship and r=0.05 to1.0 strong relationship between two variables.

When we see the relationship between the demographic variables sex, age and education and the dependent variable (Employees' performance), Pearson correlation coefficient in the coefficient matrix in Table3 above reflected that there is no statistically significant relationship i.e. sex (female dummy; r= -0.06), age (r= 0.045), education (Degree dummy r= 0.07, 2nd degree dummy r= -0.05 and dummy for 3rd degree r=-0.02) with P value greater than 0.01. Hence, the result indicated that, all demographic variables for the study have no significant relationship with EP while studies by Samwel (2018) and Israr. & Haq (2014) found significant relationship between demographic variable and EP.

Regarding the relationship between PMS (goal setting, performance measurement, feedback, reward and Amendment) and employees' performance (EP); the Pearson correlation coefficient reflected that there is statistically significant and moderate relationship between employees' performance and goal setting with 99% confidence interval (r= 0.464, P= 0.000<0.01). The Positive relationship between goal setting and EP supported by Latham and Locke (1979) goal theory which disclose the role of setting goal to boost employee Performance as it directs attention to priorities, stimulate effort and challenge people to bring their knowledge and skills to increase their chances of success. Buchner (2007 cited in Luong, 2012) also confirmed a positive link between goal setting and employees' performance

Besides, EP have statistically significant and moderate relationship with Performance Evaluation (r=0.422, P=0.000<=0.01) and reward and amendment (r= 0.445, P= 0.000<0.01), revealed statistically significant and moderate relationship with employees' performance while, feedback (r= 0.508, P= 0.000<0.01) have a strong relationship with employees' performance. According to Bandura (1986), feedback helps employee to develop and strengthen positive self-belief, what people believe powerfully impacts on their performance. Besides, feedback recognized as a crucial part of performance management processes as it serves as a means of shaping behavior. As people receive feedback on their behavior, they appreciate the discrepancy between what they are doing and what they are expected to do and take corrective action to overcome the discrepancy.

Hence, the elements of PMS i.e. goal setting, performance evaluation, feedback, reward and amendment have a Positive and moderate relationship with EP based on Chon (1988) assertions (r= 0.10 to 0.29 weak relationship, r =0.30 to 0.49 moderate relationship and r=0.5 to1.0 strong relationship between two variables). Bedassa & Shimelis (2021) who found a positive relationship between PMS components (i.e goal setting, performance evaluation, performance reward, and performance feedback) and EP.

Regression Analysis

Simple regression analysis techniques were used to assess the predicting ability of independent variables i.e. Performance Management system (PMS) on employee performance (EP). A preliminary analysis was conducted to ensure that the assumptions of regression analysis were fulfilled.

Table4. Model Summary

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	Change Statistics				
					R^2 Change	F Change	df1	df2	Sig. F Change
1	.519[a]	.269	.268	.48247	.269	178.958	1	486	.000
a. Predictors: (Constant), PMS,									
b. Dependent Variable: Employee Performance									

3.10.1. Table5. ANOVA Table

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	41.657	1	41.657	178.958	.000[b]
	Residual	113.129	486	.233		
	Total	154.786	487			
a. Dependent Variable: Employee Performance						
b. Predictors: (Constant), PMS						

The model summary table presents R and R^2, adjusted R^2, std. Error and sig. F change value presented. Besides, the ANOVA table presents the sum of squares, degree of freedom (df), Mean Square, and level of significance. Henceforth, discussion and interpretation made based on the results presented in Tables 4 and Table5.

According to Ozili (2023), in social science research, the value of R square falls in between 0.1 to 0.5, is acceptable if explanatory variables are statistically significant and the sample is large. Accordingly, the value of R^2 is 26.9 with P-value=0.000<0.01. Besides, R^2 value (R^2=26.9%) in the model summary indicated that, the overall model of the study can explain 26.9 % of change in EP. This implies statistically significant and moderate contribution of PMS in predicting employees' performance with 1% level of significant. The F-value in the ANOVA table revealed that the overall model is statistically significant with F (1, 486) = 26.9%, P=0.000< α =0.01 which shows the model is fit. The results from the regression concur with other research findings such as Israr &Haq (2014) who confirmed significant and positive effect of PMS on teachers' Performance. In short, the result revealed that PMS in selected sectors of AACA have positive and moderate effect on employees' performance.

Regression Coefficient Analysis

Table 6. Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2.060	.105		19.680	.000		
	PMS	.428	.032	.519	13.378	.000	1.000	1.000

a. Dependent Variable: Employee Performance

Source: SPSS output (2023)

The above coefficient table presents Unstandardized and Standardized Coefficients of Beta (B), t-value, sig. value among others. When we see sig value independent variable (PMS) and constant (p-value= 0.000< α=0.01) were statistically significant to predict EP. Standardized β **coefficient of** PMS= 0.512, indicated a 1% change in PMS can explain 0.52 change in EP.

Finally, based on unstandardized Beta coefficient, here is the operational model of study is **EP= 0.52PMS+ 2.06 + e;** where PMS= Performance Management System and EP=Employees' Performance and **β1, is** coefficient of PMS.

In general, the overall result revealed the existence of positive and moderate relationship between components of PMS i.e. goal setting, performance evaluation, feedback, reward and amendment and EP in the selected sectors of Addis Ababa city Administration. Besides, PMS can predict 26.9% of change in EP in the sectors. Hence, the sectors should strive to effectively implement

Performance Management system to enhance its' contribution on improving employees' performance.

Conclusion

Performance Management System is among the New Public Management (NPM) reform initiatives that has been adopted and implemented in Ethiopia, aiming to bring performance improvement in the public sectors and improving individuals' performance. The study examined the effects of Performance Management System on Employees' Performance in the selected public sectors of Addis Ababa city Administration. A quantitative research approach and descriptive-explanatory design were employed; and primary data were collected from employees, process owners and leaders in the selected sectors. Both descriptive statistics (Mean and Standard deviation) and inferential statistics (regression analysis) were used to examine the relationships and predicting ability of performance management system on employees' Performance.

The finding indicated that, Employees' performance have statistically significant and moderate relationship with components of PMS cycles (goal setting r= 0.450, P= 0.000<0.01), performance evaluation (r=0.389, P=0.007<=0.01) and reward and amendment(r= 0.445, P= 0.000<0.01), while a statistically significant and strong correlation exhibited with feedback(r= 0.508, P= 0.000<0.01). Moreover, PMS can explain 26.9% of the change in employees' Performance (P=0.000< α =0.01). Accordingly, the overall model of the study can explain 26.2% change in employees' Performance with (F (4, 483) = 26.9%, P=0.000< α =0.01) 99% confidence interval.

Generally, the result indicated that Performance Management system components (goal setting, performance evaluation, feedback, reward and amendment) have a moderate relationship with employees' Performance; and PMS can explain 26.9% of change in EP with 99% confidence interval. Hence, more emphasis should be given to strengthen performance management system cycle in the sector to boost its contribution in improving employees' performance.

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3.11. Root Cause Analysis of E-government Service Quality Failure in Ethiopia

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Abstract

E-government services, also known as digital government services, refer to the use of information and communication technologies (ICTs) by governments to provide public services to citizens, businesses, and other government agencies. These services aim to transform traditional government services by improving the efficiency, accessibility, and transparency of government operations while enhancing citizen engagement and satisfaction. Despite the huge investment in these initiatives, E-government services in Ethiopia often face various challenges that lead to quality failures. This study, thus, tries to provide a thorough analysis of the complex problems that contribute to e-government service quality failure in the country. It highlights specific technological issues, and organizational and environmental hurdles. To achieve the objective, the study employs a mixed-method approach. Quantitative data are collected through surveys to understand customer perspectives, while qualitative insights are gained from interviews with stakeholders and direct observations at service centers. The research focuses on customers of four specific government offices, utilizing purposive sampling to ensure a representative analysis. The study attempts to reveal the underlying causes of e-government service quality failure by building a comprehensive model that helps to understand the root causes by including the various reasons, providing a basis for both theoretical and practical solutions. It suggests recommendations specifically designed to address the issues raised. The study not only enriches the academic discourse on e-government services but also serves as a crucial resource for policymakers, IT professionals, and administrators.

Keywords: E-government, e-government failure, Digital transformation, e-Service quality

Introduction

The digital age has significantly impacted the behaviors and expectations of individuals in communities and economies, necessitating governments worldwide to adapt and improve public administration through effective policymaking(Zaffiro & Mourgis, 2018). This adaptation involves integrating technological advancements to create governance models that are open, reliable, and inclusive, aimed at enhancing public welfare (Agbozo & Spassov, 2018). The global trend towards e-government adoption highlights its benefits in terms of convenience, cost-efficiency, and time savings (Nunes et al., 2017), supporting goals of transparency, good governance, and improved service delivery. In developing countries, like Ethiopia, e-government is seen as a transformative tool for overcoming bureaucratic inefficiencies, enhancing governance, and fostering public trust, which in turn supports economic growth and aligns with the United Nations' Sustainable Development Goals (Belachew, 2010; “Goal 9: Industry, Innovation, and Infrastructure,” 2019).

However, challenges exist, such as service quality failures and citizen dissatisfaction, particularly in developing countries like Ethiopia where e-government initiatives have encountered numerous

setbacks (Lessa & Tsegaye, 2019). These failures often result from low perceived quality and the lack of proper backend and inter-departmental connectivity, underscoring the importance of high-quality digital services for the success of e-government projects. Recognizing these issues, the Ethiopian government has revised its e-government Strategy for 2015-2020, focusing on creating a conducive ecosystem for e-services, enhancing digital readiness, and fostering innovation to improve service delivery and stimulate economic growth.

The push towards e-government is driven by the need to meet the evolving demands of the digital age, promising improved governance, efficiency, and citizen satisfaction. Despite challenges, especially in developing countries, strategic planning and innovation in e-government initiatives are crucial for overcoming these obstacles and realizing the full benefits of digital governance.

Statement of the Problem

E-Government initiatives utilize digital technologies to enhance the delivery of government services, aiming to make them more accessible, efficient, and transparent (Lindgren & Veenstra, 2018). These services promise to transform public service delivery, offering time and cost savings, and facilitating access to information and services beyond geographical and temporal limitations (Amanbek et al., 2020). Additionally, E-Government has the potential to increase government transparency, reduce corruption, and encourage citizen participation (Al-Nidawi et al., 2018; Lessa et al., 2016). However, the journey towards fully realized digital governance in Ethiopia has been fraught with challenges.

Despite significant investments by the Ethiopian government and the Ministry of Innovation and Technology (MInT) in E-Government, the expected adoption and utilization rates have not been met. The populace continues to prefer traditional, in-person interactions over digital services (Lessa & Tsegaye, 2019). This preference highlights a critical issue: the failure to meet user expectations and the resulting dissatisfaction with digital services (Ibraheem et al., 2016). The Ethiopian Electronic Government Strategic Implementation Plan II further illustrates the underutilization of government web portals, pointing to a broader engagement issue.

This reluctance towards E-Government services has contributed to Ethiopia's declining performance in the United Nations' Electronic Government Development Index (EGDI), with the country's ranking falling from 151st in 2018 to 179th in 2022[2] (UN E-Government Survey, 2022). This decline signals significant service quality failures and underscores the urgent need for a focused investigation into the barriers hindering effective E-Government implementation. While existing literature has explored various facets of E-Government in Ethiopia, including factors influencing adoption and proposals for improving website usability and accessibility (Feyisa, 2020; Zeleke, 2018), a dedicated study on the quality failures of E-Government services remains notably absent. These service quality issues, reflective of the disconnect between the potential and actualization of E-Government, call for a detailed examination of the technological, organizational, and environmental factors at play.

This research aims to fill this gap by identifying the root causes behind the quality failures of E-Government services in Ethiopia. The study will analyze these fundamental issues to identify practical insights and strategies that improve the reliability, usability, and effectiveness of E-Government services. This will not only help policymakers, service providers, and stakeholders to manage the complexities of delivering digital services but also bolster Ethiopia's goals for digital growth and socio-economic development.

Objective

[2] https://publicadministration.un.org/egovkb/en-us/Data/Country-Information/id/58-Ethiopia

The general objective of this study is to identify the root causes of E-Government service quality failure in Ethiopia and strategies how to address these causes.

Research Question

The research question for this study focuses on understanding the underlying reasons behind the failure of E-Government service quality within the Ethiopian context and exploring potential solutions to mitigate these issues.

- *What are the root causes of E-government service quality failure in the Ethiopian context?*
- *How can those root causes be addressed?*

Literature Review

E-government utilizes Information and Communication Technologies (ICTs) to enhance public service delivery, revolutionizing interactions between government entities and stakeholders (Almutairi et al., 2020; Madariaga et al., 2019; Solinthone & Rumyantseva, 2016). Defined variously, e-government fundamentally aims to improve government operations' efficiency, transparency, and citizen engagement through digital platforms (Abu-Shanab & Harb, 2019; District, 2012; Jain, 2017; Malodia et al., 2021; Scholl, 2020). E-government services are classified into four categories: Government to Citizen (G2C), Government to Business (G2B), Government to Employee (G2E), and Government to Government (G2G), each facilitating specific interactions that streamline processes and improve accessibility and efficiency (Joshi & Islam, 2018; Omar et al., 2011; Rao, 2011; Solinthone & Rumyantseva, 2016; Van Den Boer et al., 2016). These services cover a wide range of applications, from license renewals to inter-governmental data sharing, significantly benefiting citizens and government operations alike (Khanra & Joseph, 2019; Mahlangu & Ruhode, 2020; Tremblay-Cantin et al., 2023; Zautashvili, 2017). The benefits of e-government services extend to time and cost savings for citizens, improved transparency, accountability, and the deterrence of corrupt practices, highlighting their role in fostering trust and enhancing the quality of government service delivery (Adam, 2020; Alshehri & Drew, 2010; Bwalya & Mutula, 2015; Elbahnasawy, 2014; Máchová et al., 2018; Venkatesh et al., 2016).

Evaluating service quality in e-government involves understanding customer expectations and the perceived performance of services. Models like SERVQUAL, WebQual, and e-GovQUAL provide frameworks for assessing various aspects of service quality, including reliability, responsiveness, assurance, empathy, and the quality of digital interfaces (Loiacono & Richard, 2002; Papadomichelaki & Mentzas, 2009; Parasuraman et al., 1985). Ethiopia's e-government initiatives, despite facing challenges, underscore the potential for digital transformation in public service delivery. However, the country's declining performance in the UN E-Government Survey indicates significant room for improvement (Belachew, 2010; Lessa, 2015; Zeleke, 2018 ; UN E-Government Survey, 2022). Research on e-government service quality reveals varying levels of satisfaction and areas for improvement, emphasizing the importance of continuous evaluation and adaptation to meet user needs and expectations (Dodeen, 2019; Frehiwot Tadesse, 2023; Špaček & Špačková, 2023; Tan et al., 2016; Wijatmoko, 2020).

The eGovQual framework, supplemented by identified factors affecting e-service quality, provides a comprehensive approach to diagnosing and addressing service quality failures in e-government, ensuring the alignment of services with citizen expectations and enhancing the overall effectiveness of digital government initiatives (Kanaan & Kanaan, 2013; McDermot et al., 2022; Park et al., 2016).

Methodology

This study on e-government service quality failure in Ethiopia employed a mixed research approach, integrating both quantitative and qualitative methods to comprehensively understand the phenomenon from multiple perspectives (Indu & Vidhukumar, 2020; Sharma et al., 2023). By leveraging measurable data and in-depth analyses, the research aimed to uncover the root causes of service quality issues from both user and provider viewpoints. Quantitative data was obtained through surveys targeting users of e-government services, while qualitative insights were gathered via interviews with stakeholders, including IT specialists, policymakers, and direct observations at service centers.

Approaches and Strategies

Adopting a mixed-methods approach allows for a robust examination of e-government service quality failures, balancing the broad, generalizable insights gained from quantitative analysis with the detailed, contextual understanding provided by qualitative research(Cárdenas, 2019; Tharsika & Pratheepkanth, 2020). The study strategically employs exploratory research, utilizing surveys with closed-ended questions for quantitative data collection, and in-depth, semi-structured interviews for qualitative insights (Yin, 2012).

Study Setting and Participant Selection

The research focuses on a subset of Ethiopian government offices providing e-services, selecting four offices based on service usage and user volume. This choice facilitates manageable and meaningful data collection and analysis, reflecting broader trends and issues within the country's e-government service provision. Sampling is purposive, aiming to capture diverse user experiences and insights from key informant stakeholders involved in e-government service provision (Turner, 2020).

The researcher used Yamane's formula (1967) to determine the sample size with a 95% confidence level and a deviation factor of less than 5%. The formula is:

$$\mathbf{n} = \frac{N}{1 + Ne^2}$$

Where: n = Sample Size, N = Total Population Size (218,000 registered customers on www.eservices.gov.et),

e = the level of precision/ degree of error expected (0.05) applying the formula Thus, the sample size for the target population is 399.

Data Collection and Analysis

Data collection combines survey questionnaires, in-depth interviews, and direct observations. Surveys collect quantitative data from users, while qualitative data is sourced from interviews with service providers and stakeholders, offering a comprehensive view of the challenges and failures in e-government services. The analysis employs SPSS for quantitative data and thematic analysis for qualitative data, supplemented by Root Cause Analysis techniques to identify underlying issues (Braun & Clarke, 2021; Papadomichelaki & Mentzas, 2013).

Validity and Reliability

Ensuring the research's validity and reliability involves rigorous methodological design and execution. Validity is addressed through the careful design of measurement instruments to accurately capture the intended phenomena, while reliability is ensured through consistent application and testing of these instruments over time (Sürücü & Maslakci, 2020). The study used SPSS to test questionnaire reliability and validate interview responses through participant review, aiming for authentic, credible results.

Result and Discussion

Quantitative analysis presentation

Data was gathered by distributing emails containing a questionnaire to respondents, resulting in a total of 525 completed questionnaires. Before processing and analyzing this data, tests for validity and reliability were performed. These tests were conducted to ensure that the questionnaire accurately and consistently measured the intended data. Reliability testing in this study was conducted by computing the coefficient of Cronbach alpha.

According to Dukes (2005), Cronbach's alpha serves as a measure for evaluating the internal consistency reliability of an instrument that comprises multiple items. An instrument is considered to possess Cronbach alpha reliability if its value exceeds 0.70. The findings from the reliability test are displayed in Table 1. According to the data in Table 1, it is evident that all operational variables satisfactorily exceed the Cronbach alpha threshold (>0.7). The specific Cronbach Alpha values recorded were 0.830 for trust, 0.838 for reliability, 0.897 for citizen support, 0.859 for efficiency, 0.847 for the content and appearance of information, and 0.752 for the functionality of the interaction environment. These findings suggest that the instrument is reliable. Following the assessments of validity and reliability, both the dependent and independent variables have been deemed qualified for further analysis.

No	Variables	Cronbach Alpha
1	Trust	0.830
2	Reliability	0.838
3	Citizen Support	0.897
4	Efficiency	0.859
5	Content & Appearance of Information	0.847
6	Functionality of The Interaction Environment	0.752

Table 9 Result of reliability testing

Variable	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)
TRS1	3.6	14.1	39.0	18.9	24.4
TRS2	5.1	12.6	36.2	20.8	25.3
TRS3	4.6	15.4	34.7	23.0	22.3
TRS4	5.0	16.0	40.0	19.0	20.0
RLB1	13.5	46.5	13.5	9.1	17.3
RLB2	20.6	37.9	17.1	10.3	14.1
RLB3	17.1	38.7	17.5	9.3	17.3
RLB4	7.2	20.6	21.3	23.4	27.4
RLB5	13.1	37.3	24.6	9.5	15.4
CS1	17.1	40.6	18.3	9.9	14.1
CS2	16.2	30.5	29.1	10.5	13.7
CS3	21.5	39.0	22.1	5.9	11.4
CS4	17.5	34.7	29.1	7.8	10.9
EFF1	9.0	31.2	18.5	18.9	22.5
EFF2	8.6	25.5	29.3	19.2	17.3
EFF3	15.4	31.0	21.9	13.9	17.7
EFF4	12.0	36.0	25.9	12.0	14.1
EFF5	15.4	28.4	21.5	16.6	18.1
CONA1	10.9	33.9	25.9	12.0	17.3
CONA2	5.7	22.3	35.4	18.3	18.3
CONA3	8.4	37.7	26.9	12.2	14.9
CONA4	2.5	9.1	23.6	29.1	35.6
CONA5	6.1	28.4	22.3	19.8	23.4
CONA6	9.3	25.7	24.2	17.1	23.6
FUNIE1	21.1	40.0	21.3	7.8	9.7
FUNIE2	10.5	21.9	39.0	14.5	14.1
FUNIE3	14.9	37.1	28.6	8.0	11.4

Table 10. Statistical frequency analysis

The survey data reveals nuanced perceptions among respondents regarding Trust, Reliability, Citizen Support, Efficiency, Content Appearance, and Functionality of the Interaction Environment, gauged through a Likert scale. Trust variables (TRS1 to TRS4) exhibit a slight inclination towards positive responses, with many participants opting for neutrality, suggesting a generally favorable yet cautious trust in the interaction environment. In contrast, Reliability (RLB1

to RLB5) demonstrates a broad spectrum of responses, with a tendency for higher disagreement in RLB1 and RLB2, hinting at concerns over reliability aspects that may need addressing.

Citizen Support (CS1 to CS4) reflects a propensity towards disagreement, especially in CS3, indicating areas of discontent among the respondents regarding support aspects. This contrasts with the Efficiency category (EFF1 to EFF5), where responses are more evenly spread across the scale, showcasing varied perceptions of efficiency with no clear consensus leaning either way. Content Appearance (CONA1 to CONA6) enjoys a robust positive reception, particularly evident in CONA4 and CONA5, where a substantial number of respondents show satisfaction, indicating a high appreciation for content's appearance.

However, the Functionality of the Interaction Environment (FUNIE1 to FUNIE3) skews towards disagreement, with FUNIE1 specifically highlighting notable dissatisfaction related to the interaction environment's functionality. This mixed feedback across different areas points to strengths in trust and content appearance, while also underlining potential improvement points in reliability, citizen support, efficiency, and especially functionality, suggesting a need for targeted enhancements to boost user satisfaction and the quality of interaction within the environment.

Descriptive Statistics				
Variable	N	Minimum	Maximum	Mean
Trust	525	1.00	5.00	3.4276
Reliability	525	1.00	5.00	2.8415
Citizen Support	525	1.00	5.00	2.6119
Efficiency	525	1.00	5.00	2.9741
Content and appearance of information	525	1.00	5.00	3.2200
Functionality of the interaction environment	525	1.00	5.00	2.6959

Table 11. Statistical descriptive

The table provided offers a comprehensive overview of survey responses across several variables, namely *Trust*, *Reliability*, *Citizen Support*, *Efficiency*, *Content and appearance of information*, *and Functionality of the interaction environment*, with each rated on a scale from 1 to 5. All variables were evaluated by 525 respondents, indicating a consistent sample size across the board. The ratings span the full scale, with the minimum at 1.00 and the maximum at 5.00 for each variable. A closer examination reveals nuanced insights into each attribute. Trust emerges as the highest-rated variable with an average score of 3.4276, suggesting a moderately high level of trust among respondents, though the standard deviation of .91674 indicates some variation in perceptions. *Reliability* and *Functionality of the interaction environment* are perceived less favorably, with average scores of 2.8415 and 2.6959 respectively, and both display considerable variability in respondent opinions as highlighted by their standard deviations (1.00883 and .96041). *Citizen Support* is marked by the lowest average score of 2.6119, coupled with the highest standard deviation (1.07595), pointing to a significant disparity in respondent views and signaling it as the area most in need of improvement. *Efficiency* and *Content and appearance of information* receive moderate average ratings of 2.9741 and 3.2200, respectively, reflecting a generally positive but varied perception among participants. This data set illustrates a range of perceptions on the surveyed attributes, with trust receiving the most favorable views overall. The notable variability in scores, especially for Citizen Support, suggests diverse opinions among respondents, underscoring the importance of targeted interventions to address specific areas of concern and enhance overall satisfaction or trust levels.

Qualitative analysis presentation

The qualitative data has been analyzed through thematic analysis. The outcomes of the interviews are presented in narrative form and organized according to the questions asked during the interviews.

Legal and Regulatory Framework

A critical hindrance to the deployment of e-government services is the lack of clear, authoritative legislation and an effective governance structure. The existing legal frameworks, such as the Negarit Gazette and various proclamations, do not adequately delineate the Ministry of Innovation and Technology's (MInT) powers in enforcing e-government policies. The absence of specific legislation outlining MInT's roles and the failure to establish a Digital Economy Council as required by the E-Transaction Proclamation undermine the coordination and enforcement of digital initiatives across government agencies. This legislative ambiguity hampers the ministry's ability to ensure uniform adoption and integration of digital services, leading to siloed implementations and a lack of standardized, interoperable platforms.

Performance monitoring

Platforms of critical importance necessitate ongoing vigilance to ensure they operate at optimal performance without interruption. However, this depends on having an operational agreement in place with the data center. Currently, the management of the E-Services portal is reactive, addressing problems as they arise. The project team lacks tools or systems to proactively monitor the service level and health of the portal. Issues are typically recognized and addressed only after service providers report performance degradation to MInT or the relevant vendor. Interviews with key informants revealed that the E-Services portal is plagued by issues of instability, including delays, bugs, system failures, and loss of data during the processing of service requests. These problems have led to dissatisfaction among employees using the E-Services portal. Additionally, service providers reported that customers frequently do not receive notification SMS texts from the portal, leaving them unaware of the need to submit additional documents or clarifications.

Digital literacy and public awareness

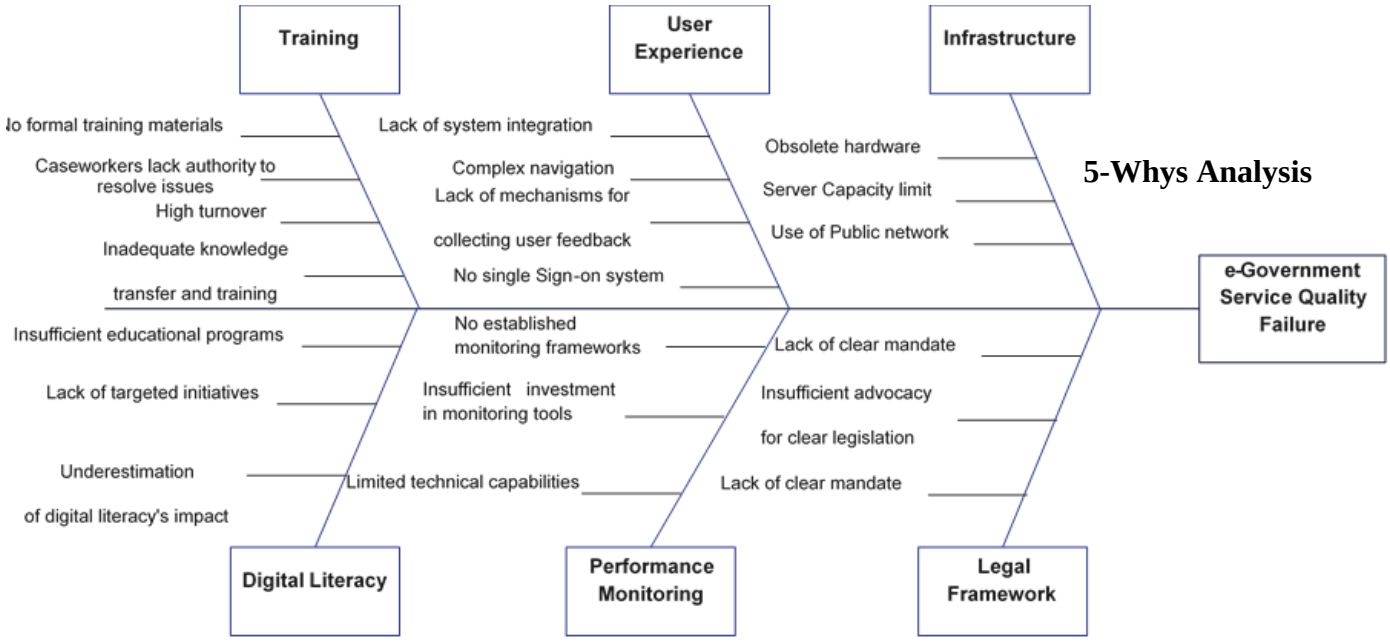
The challenges surrounding e-Government services primarily revolve around the issues of lack of awareness and digital literacy. When citizens are not informed about the availability of e-Government platforms, these systems experience low engagement and utilization, hindering their intended reach and impact. This unawareness can also result in misunderstandings about the services' purposes and benefits, fostering mistrust or disinterest among potential users. Consequently, governments might allocate resources inefficiently, focusing on services that do not meet the actual needs or preferences of their citizens. Furthermore, effective use of e-Government services necessitates a certain level of digital literacy among users. Those lacking these skills may struggle to navigate the services, leading to frustration and the potential abandonment of the platform. Moreover, insufficient digital literacy heightens the risk of exposure to online security threats, such as phishing and scams, thereby jeopardizing the trust and credibility of e-Government platforms. The disparity in digital literacy across various demographics—such as among older adults, low-income families, and rural communities—further exacerbates inequalities in service access. This digital divide means that certain groups are at a disadvantage, less likely to benefit from the advantages of e-Government services.

Lack of Training

Caseworkers often face inadequate training, with service providers not offering structured training materials. Typically, new caseworkers learn through on-the-job shadowing of their colleagues. This shortage in formal training can result in caseworkers lacking essential customer service skills,

hindering their ability to communicate effectively and help citizens. Consequently, this can lead to dissatisfaction and a perception of poor service quality.

Fishbone diagram of E-government service quality failur



The 5 Whys analysis, initially developed as a root cause analysis tool, has been adapted for IT project management and software development (Kohara, 2011). It helps identify the root causes of problems and defects, with the number of iterations varying as needed (Selvaraj et al., 2018).
In the Fishbone diagram, the primary causes of E-Government service quality failure include Infrastructure, Training, User Experience, Legal Framework, Performance Monitoring, and Digital Literacy. Each contributor is analyzed using the 5 Whys method to determine their root causes. This process continues until the root cause for each contributor is identified

Category	Why 1	Why 2	Why 3	Why 4
Infrastructure	Obsolete servers	Budget constraints	Prioritization issues	Insufficient understanding of infrastructure needs
User Experience	Poor user interface design	Lack of user feedback	Insufficient collaboration between teams	Lack of emphasis on user-centered design
Training	No formal training materials	Oversight in program development	Lack of understanding of training importance	-
Performance Monitoring	No established monitoring frameworks	Limited technical capabilities	Insufficient investment in monitoring tools	-
Legal Framework	Ambiguity in legal provisions	Inadequate stakeholder collaboration	Lack of clear mandates	Insufficient advocacy for clear legislation
Digital Literacy	Insufficient educational programs	Lack of targeted initiatives	Underestimation of digital literacy's impact	-

Conclusion and Recommendation

The comprehensive analysis of e-government service quality failure in Ethiopia reveals a multi-faceted issue underpinned by technological, organizational, and environmental challenges. Quantitative data analysis demonstrated significant variability in perceptions of trust, reliability, citizen support, efficiency, content appearance, and functionality of the interaction environment among e-government service users. Key findings indicated a moderate level of trust but highlighted substantial areas for improvement in reliability, citizen support, efficiency, and particularly functionality. Qualitative insights underscored the critical role of a clear legal and regulatory framework, performance monitoring, digital literacy, public awareness, and training in influencing the effectiveness and user satisfaction of e-government services.

The study identified the absence of specific legislation for enforcing e-government policies, reactive management of e-services, issues of digital literacy and public awareness, and insufficient training for caseworkers as root causes impeding the quality and efficiency of e-government services in Ethiopia. These findings suggest a complex interplay of internal and external factors that constrain the potential of digital governance to enhance public service delivery and citizen engagement.

To effectively enhance the quality of e-government services in Ethiopia and address the identified challenges, a comprehensive approach encompassing legislative, operational, educational, and infrastructural reforms is essential. It is recommended that comprehensive legislative reforms be implemented to clearly define the powers and responsibilities of the Ministry of Innovation and Technology (MInT), including the establishment of a Digital Economy Council to ensure coordinated and standardized digital service adoption across government entities. A shift towards proactive performance monitoring strategies for e-services platforms is crucial to ensure optimal operation and user experience. This should be complemented by nationwide campaigns to improve digital literacy and public awareness about the benefits and availability of e-government services, targeting inclusivity across all demographics. Additionally, the development and implementation

of structured training programs for caseworkers are paramount to enhance service delivery quality. These programs should encompass customer service skills and technical knowledge necessary to efficiently navigate e-government platforms. Emphasis on user-centric design and development, involving citizens in the creation process of e-government services, will ensure these services meet user needs and preferences, thereby increasing adoption rates and satisfaction. Finally, significant investments in ICT infrastructure and internet connectivity are necessary to support the reliable delivery of e-government services across the country, ensuring accessible and efficient digital governance for all citizens.

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4. ENVIRONMENT & DEVELOPMENT

4.1. Climate Smart Agriculture as a Livelihood Resiliency in Ethiopia: As a Tool for Sustainable Development – Systematic Review

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Abstract

Ethiopia is under severe challenge due to climate crises which threatens the livelihood of millions of smallholder farmers who are reliant on rain-fed agriculture. As a response, climate smart agriculture practice evolved as a promising strategy to build climate crises resilient livelihood through improving adaptive capacity of framers. The review synthesized research on climate smart agriculture practice to understand livelihood vulnerability to climate change, effectiveness of these practices to reverse the negative impacts of climate change and the determinants factors for successfulness of practices. As a method a systematic review is employed through a comprehensive search of relevant databases. Based on the inclusion and exclusion criteria 34 peer review research articles which are published in the time range from 2019 to 2023 were selected for review. The data synthesis and extraction were managed through predefined framework focusing on key words such as climate smart agricultural practices, livelihood vulnerability, effectiveness of the practices and factors influencing adoption. The review found that soil and water conservation, crop diversification, agroforestry and small-scale irrigation as a major climate smart agricultural practice implemented in response to climate crises. These climate smart agricultural practices have success story in different parts of the country in improving soil health, water retention and agricultural productivity by reducing vulnerability to climate extremes. The review also evidenced that the practices helped smallholder farmers to improve their food security thereby enhance their livelihood through reduction of production risks. However, successfulness of the practices is dependent on specific practices, local context and implementation strategies. Access to knowledge, market access, land tenure and institutional support and approach are identified as determinant factors for effectiveness of the practices. Implementations of climate smart agriculture technologies offer as significant potential in the country to build climate resilient livelihood in the face of climate crises. However, to maximizing the impact and for wider adoption, it demands addressing knowledge gap, resources constraint, and institutional challenges.

Key Words*:* *climate-smart, land management, resilient livelihood, Ethiopia.*

Introduction

In Ethiopia, warming temperature, erratic rainfall, frequent drought and intense flood are some of the characteristics of climate change and variability (Gizaw *et al*., 2021). This nature of climate change and variability has resulted in low agricultural productivity and food insecurity. The country has faced many drought events followed by crop failure and total endangering of the livelihood of the community. The livelihood vulnerability due to climate change and variability is more severe in the rural community where the livelihood is mostly dependent on rain fed agriculture (Wakweya, 2023).

The impact of rain-fed agriculture on rural livelihood is more pronounced in smallholder farmers and pastoralists because they are heavily relied on rain-fed agriculture (Alemu *et al*., 2018). This erratic rainfall and frequent droughts caused by climate change and variability imposed along shadow over food security and economic well-being of the community (Haron and Subir, 2020; Wakweya, 2023). This livelihood vulnerability due to climate change and variability is aggravated by land degradation and soil erosion, which poses additional risk to agricultural productivity (Kindiye *et al*., 2023; Gizaw *et al*., 2021). To build climate resilient livelihood, the need for urgent intervention is necessary to cope up with the negative impact of climate change. Therefore, climate smart agricultural intervention is vital Practice to build climate resilient and sustainable rural livelihood.

Climate-smart land management Practice gives a new hope for countries with highly vulnerable and less adaptive capacity. The Practice focuses mainly on three pillar objectives which includes climate change mitigation, climate change adaptation and improving land productivity. If climate smart agriculture is effectively implemented in context-specific basis, it has the capacity to enhance agricultural productivity, build climate crises resilient livelihood and mitigate climate crises (Kiros *et al*., 2019). The Practice not only increase adaptive capacity of smallholder farmers and improve land productivity but also it has the capacity to mitigate climate crises. To achieve these objectives, local context-based recognition and adaptation of climate smart agriculture is necessary (Sarah *et al*., 2018). This necessitates further call for a shift from top-down approaches to trans- disciplinary research. Therefore, the integration of scientific and local knowledge promotes the effectiveness and sustainably of the Practice which further helps to achieve the three pillars of climate smart agriculture technologies (Nugun *et al*., 2022). Recognizing and understanding of the benefits of climate smart agricultural practices are vital and primary for the effectiveness of the practice.

Climate smart agriculture has multi benefits and sustained impact in combating land degradation thereby reduce soil erosion and preserving soil fertility. It has also the capability to improve crop diversification and cover cropping (Sultan Mohammed *et al*., 2023). This results in overall increment in agricultural productivity and food security, which helps to save the lives of many rural communities from hunger (Mesay and Esubalew, 2023; Elias andYitbarek, 2023). Besides, climate smart agriculture capacitates communities to adapt and build climate resilient livelihood in the face of changing climate. Inclusion of climate smart agricultural practices such as water harvesting and drought resistant crop varieties assures farmers to respond against the impacts of climate shocks effectively (Astewel *et al*., 2023; Benyam and Murad, 2023). On the other hand, the practice of crop rotation and cover cropping increased soil microbes and carbon storage (Kiros *et al*., 2019; Nugun *et al*., 2022). Moreover, the practice of terracing minimizes soil erosion thereby prevent loss of carbon rich topsoil (Kindiye *et al*., 2023; Sultan Mohammed *et al*., 2023). Being this the fact, there are many factors that determines the implementation of climate smart

agricultural practices. Understanding these determinant factors is far reaching important to build climate resilient livelihood development (Haftu, 2019).

Therefore, climate smart agriculture mitigates vulnerability to climate change and variability in the meantime it enhances livelihood resilience. This is achieved through integrated implementation of sustainable land use practices with climate adaptation and mitigation strategies. However, there are inadequate research hindering evidence-based interventions to utilize the full potential of climate smart agriculture thereby advance the economic development in the country. Thus, the objective of this review is to assess the potential of climate-smart land management practices in reacting against the livelihood vulnerability in Ethiopia considering the social, environmental, and economic dimensions. The review focused on effectiveness of climate smart agriculture technologies and its impact on livelihood resiliency. The review also focused on identifying existing research and knowledge gaps.

Methodology

As the study is based on systematic review, a systematic selection of references related to the topic under review were considered, which comprises a systematic identification, selection and categorization of papers.

The literature sources used for the review are Web of Science, Scopus, Elsevier and Google Scholar as these sources are considered as reputable databases and contain peer-reviewed papers. Due to the proficiency of the reviewers, articles published in English were subjected for review. For the inclusion of the most relevant papers, key words such as "climate smart", "land management", "livelihood vulnerability and Ethiopia" were considered. Besides, titles and abstracts were also vital for the inclusion of the important papers. The selection process of the papers for review passed the inclusion and exclusion criteria to meet the objectives.

Inclusion and exclusion of articles for the review

Criteria	Included	Excluded	Reason for screening
Publication date article	Since2018	Before 2018	To insight the current perspectives of the thematic area
Publication language	Articles in English	Articles other than English language	English language only
Publication theme	Articles on climate smart agriculture and livelihood vulnerability	Articles not relevant to the topic under review	To address the issue adequately
Availability of articles	Open access articles	Non-open access articles	Requesting purchase
Types of articles	Peer reviewed research articles	Articles other than peer reviewed	Availability and originality of the articles
Location of study	Ethiopia	Outside of Ethiopia	It is scope of theme

After systematic screening of the papers through inclusion and exclusion criteria, a total of 34 articles were found the most relevant for the topic under review.

Empirical Evidence

Climate Change, Variability, Trends and Extreme Events

Climate change is a long-term shift in weather patterns mostly attributed to human unwise utilization of the resources the earth (Seleshi and Camberlin, 2020) while climate variability denotes the short-term change in weather patterns (Eshetu *et al*., 2019). Climate change is showing an increasing trend at global level and continued to disturb the natural system of the planet earth (Haron and Subir, 2020). Climate change and variability are experiencing, and its adverse impact is noticeable and increasing from time to time.

There is evidence of climate change in Ethiopia. Temperature as one indicator of climate change is increasingly rising from time to time which has shown a warming trend of 0.5^0C per decade over the past century (Gebreet *et al.*, 2019). This is in line with National Meteorology Agency projection of temperature rise of 2^0C to 3 ^{0}C by 2050 (NMA, 2020) considering business as usual scenarios. The unprecedented average temperature increase has resulted in decrease of the number of cold days and nights, an increase in number of warm days and nights, frequency of extreme high temperatures (Haftu 2019. Rainfall the other major pointer of climate change with increasing variability even though it might has not shown clear total annual rainfall trend (Seleshi and Camberlin, 2020). The increased variability has resulted in frequent and intense droughts followed by heavy precipitation which leads to increased risk of floods and landslides. In Ethiopia rainfall is becoming very erratic and highly unpredictable resulting in extended dry spells. Extended dry spells in turn (Haron and Subir, 2020) forced farmers to live in recurrent droughts. These climate crises further expose the soil to water erosion promoting the washing away of top fertile soil.

Impact of Climate Change on Soil Erosion

In the time of intense rainfall events the soil is exposed to heavy floods and landslides. The risk of soil erosion by water is more severe bare land. These rainfall events disaggregate and transport huge amount of soil (Kindiye *et al*., 2023). Steep slope natures of the topography accompanied with erratic nature of the rainfall is facilitating soil erosion by water (Haftu, 2019). Every year, Ethiopia losses 1.5 billion tons of fertile soil due to drought induced erosion (Gizaw *et al*., 2023). Besides, the erratic nature of the rainfall damages the soil and water conservation strictures (Nugun *et al*., 2022), which further aggravates erosion risk. The loss of top fertile soil pushes farmers towards poverty and food insecurity by lowering crop land productivity. The status of water availability is diminishing due to lowering of the land ability to retain moisture (Kiros *et al*., 2019). Erosion driven by climate change resulted in loss of rainwater and reduced groundwater recharge (Haftu, 2019). The loss of rainwater in the form of runoff leads to water scarcity, particularly in vulnerable regions like Tigray, where farmers are straggling to move out from recurrent drought. The traditional land management practices often provided solution to erosion, but it is challenged by erratic rain fall patterns and extreme weather events (Melese, 2019). The soil degradation is threatening agricultural productivity thereby livelihood of the community, particularly the smallholder farmers who are vulnerable to climate crises.

Livelihood Vulnerability to Climate Crises

Climate Change vulnerability in Ethiopia is characterized by erratic rainfall, increasing temperatures and extreme events (Kiros *et al*., 2019; Haron and Subir, 2020). These current characteristics of climate change in the country paved a way increase the adverse impact of climate change on agricultural productivity and food security (Gebeyanesh *et al*., 2021). Climate change

and unsustainable land use practices induced climate further magnifies the livelihood vulnerability (Kindiye *et al*., 2023).

Livelihood is sensitive to droughts further promotes food insecurity and malnutrition (Haron and Subir, 2020; Melese, 2019). Climate related water scarcity imposes additional adverse impact for domestic use and livestock production (Elias and Yitbarek, 2023). Besides, climate shocks lower adaptive capacity of rural livelihood to cope up with climate crises (Tsega *et al*., 2018).

The influential factors for livelihood vulnerability to climate crises are heterogeneous across Ethiopia. Socioeconomic factors playing pivotal role in determining the vulnerability are poverty, gender inequality and limited access to resources. (Haron and Subir, 2020; Hailemariam *et al*., 2019). Particularly, smallholder farmers lack knowledge, Practice and extension services (Nugun *et al*., 2022). Weak Institutional setup and poor infrastructural development added to the low adaptive capacity of the community (Astewel *et al*., 2023).

Climate Smart Agricultural Practices

Soil and Water Conservation Practices

The varied topographic nature added with rain-fed dependent agriculture has put the country into considerable challenges emanated from climate change and land degradation. Increased soil erosion rate attributed by land mismanagement and climate variability is imposing pressure on the livelihood of the community (Kindiye *et al*., 2023). As a response to this challenge, soil and water conservation practices evolved as key input for climate-smart land management for improved environmental and socio-economic benefits (Kiros *et al*., 2019; Kindiye *et al*., 2023; Haron and Subir, 2020; Haftu, 2019). Soil and water conservation measures reduce land degradation thereby decrease soil erosion. As highlighted by Sultan Mohammed *et al* (2023), soil and water conservation measures such as contour bunds, terraces and afforestation help to minimize soil loss. The improvement in soil stability in turn enhances land productivity (Haron and Subir, 2020).

Moreover, soil and water conservation immense impact on adapting and mitigating climate change. This is evidenced by Gebeyanesh *et al* (2021) indicating that soil and water conservation measures help to improve soil organic matter content thereby sequester carbon. In the meantime, it helps to improve soil moisture retention capacity to respond against droughts and floods (Elias and Yitbarek, 2023; Benyam and Murad, 2023). This finding is aligned to the aim of climate smart agriculture as mentioned by Kiros *et al*. (2019). The implementation of soil and water conservation measures help to improve agricultural productivity and food security.

As agriculture of the country is characterized by smallholder farmers, soil and water conservation measures help to enable smallholder farmers. Research findings of Dereje *et al*. (2019) and Mebratu *et al*. (2022) supported this idea that smallholder farmers practicing these measures helped them to increase their yields and income. Besides this, implementation of climate smart agriculture helps stallholder farmers to practice small-scale irrigation and diversified cropping systems (Nugun *et al*., 2022; Amare *et al*., 2020). As revealed by Tamirat (2022), this cyclic interaction promotes the synergies within climate smart agricultural practices paving a way for further advancements in agricultural productivity (Abiot, 2023).

Being this the fact, scaling up and promoting at large scale is facing challenges resulted from limited resources access, knowledge gaps and inadequate institutional support Haftu (2019) and Tsega *et al*. (2018). However, integrating traditional knowledge and applying participatory methods respond to these challenges (Zenebe *et al*., 2021). Hailemariam *et al*., (2019) mentioned

as gender sensitive interventions remained far reaching important to address the constraint of soil and water conservation measures.

Agroforestry and Land Use Management Practice

Under the challenges of climate change and land degradation, agroforestry and land use management play a vital role in climate-smart land management. The integration of tree and crop in farmland help to deliver multi-benefit to the farmers as the tree serves as windbreaks, reducing soil erosion and protecting crops (Nugun *et al*., 2022; Kindiye *et al*., 2023), which further helps to fix nitrogen to increase soil fertility (Kiros *et al*., 2019). These services provided by the agroforestry safeguards food security of the rural community (Astewel *et al*., 2023: Haron and Subir, 2020).

As a response to climate vulnerability, land use management strategies are far important. As point out by Sultan Mohammed *et al*. (2023), in the mountainous highlands Ethiopia, rehabilitating degraded lands through contour plowing and terraces not only combats desertification but also mitigate climate change by sequestering carbon (Kiros *et al*., 2019; Zenebe *et al*., 2021). Amare*et al*. (2020) also added that these interventions need to be contexts specific to bring the desirable impact on livelihood.

Nonetheless knowledge gap, resources limitation and lack of institutional support (Haftu, 2019; Rusha BegnaWakweya, 2023; Tsega *et al*., 2018) added with untargeted policies and extension services (Gebeyanesh *et al*., 2021) are tackling the effectiveness of climate smart agricultural practices.

Water Management

Food security and livelihoods in Ethiopia are threatened due to erratic rainfall and droughts. To address these challenges, water management is mentioned as a vital climate-smart land management strategy. Soil and water conservation measures improve soil water retention capacity (Kiros *et al*., 2019; Astewel *et al*., 2023). The stored water helps to compensate the water shortage for crop during dry seasons. Beyond this, water harvesting during rainy season supports for later use for irrigation and domestic uses (Kiros *et al*., 2019; Nugun *et al*., 2022). This reduces reliance on rain and improves livelihood resilience for climate change and variability (Elias and Yitbarek, 2023). Water harvesting Practice is more important, particularly in arid and semi-arid regions parts of the country where there is shortage of rain.

Improved water management in the face climate change increases agricultural productivity and food security. Farmers who practice efficient water utilization helped them to produce more food, even under climate stress (Gebeyanesh *et al*., 2021; Rusha Begna Wakweya, 2023), which further supports to build resilient livelihood to climate crises (Elias and Yitbarek, 2023; Tsega *et al*., 2018).

Improved Livestock Management

Currently, improved livestock management appeared as key component of climate-smart land management as it offers a multi benefit for environment and rural livelihoods. Appropriate utilization of grazing land such as controlled grazing and rotational systems contributes to soil conservation (Melese, 2019; Nugun *et al*., 2022). It is possible to reduce soil erosion by avoiding over grazing and tree planting (Kindiye *et al*., 2023). Moreover, the integration of livestock into cropland offers supplementary benefits to farmers (Kiros *et al*., 2019). Therefore, soil health is improved through animal manure composting (Astewel *et al*., 2023).

Livestock and tree crop combined agriculture practice boosts livestock breeds and feeding practices. Introducing disease and heat tolerant livestock enhanced livestock production, which in turn safeguards farmer livelihoods in climate shocks (Rusha Begna Wakweya, 2023). Improved livestock management serves as climate change adaptation through providing extra feed at the time of dry periods. In the meantime, it mitigates climate change through reducing methane production (Kiros *et al*., 2019).

For effective implementation of improved livestock management as part of climate smart agriculture needs to penetrate through various challenges. As mentioned by Gebeyanesh *et al*. (202), farmer's access to knowledge and extension services is far important. Support services for farmers to implement promote investment in improved breeds and feed production (Tsega *et al*., 2018). Moreover, community-based knowledge sharing of best practices accelerate the diffusion of successful story of livestock management practices (Zenebe *et al*., 2021).

Success Story of Climate Smart Agricultural Practices for Livelihood Resiliency

Soil and water conservation: Understanding the effectiveness of these practices is vital to scale up the positive impact and avert the negative impact. Studies conducted in the highlands of Ethiopia by Kindiye *et al.* (2023) and Sultan Mohammed *et al*. (2023), demonstrated an improved soil health and low soil erosion through soil and water conservation measures such as terraces, contour plowing and cover cropping. Similarly, a study by Astewel *et al*. (2023) and Kiros *et al*. (2019) revealed that soil and water conservation promote conservation of topsoil for better moisture retention and soil fertility improvement.

In dry land parts of the country, rainwater harvesting and small-scale irrigation remained effective in improving water use efficiency as indicated in the study by Elias and Yitbarek (2023). Similarly, the combined benefits of reduced erosion, improved soil health and efficient water management translate to higher and more stable crop yields (Benyam and Murad, 2023; Dereje *et al*., 2019) further promoted and strengthened the overall livelihood resilience (Haron and Subir, 2020; Gebeyanesh *et al*., 2021).

Implementation of soil and water conservation measures with other climate smart agriculture significantly improves overall resilience. Conversely, trade-offs may exist, therefore, careful planning is required to ensure long-term sustainability and address potential accidental consequences.

Water management: Improved water and irrigation management as part of climate smart agriculture contributes largely to build climate resilient livelihood in the face of changing climate. To evidence this, several research findings were evaluated and discussed in this review.

The study of by Elias and Yitbarek (2023) in Offa district of Southern Ethiopia showed framers practicing small-scale irrigation as part of climate smart agriculture were promoted to cultivate crops year-round, including dry seasons. Kindiye *et al*. (2023) studied the benefit of water management strategies in soil and water conservation, and they found that households were more resilient to climate shocks due to moisture retention during rainy seasons. In line to this, research conducted in rural Ethiopian households by Haron and Subir (2020) found results indicating that a strong synergy between improved water management and increased resilience to climate variability for long term livelihood security. On the other hand, implementation of water management and irrigation is challenged by several factors. This was evidenced by Haftu (2019) a study conducted in Tigray and found that access to knowledge, credit and infrastructure as major barriers. Likewise, Astewel *et al*. (2023) added that land insecurity and weak market access as

bottle neck for climate resilient livelihood. However, findings by Zenebe *et al*. (2021) forwarded as local context specific interventions is required for sustainable livelihood development.

Improved livestock: Implementation of improved livestock as part of climate resilient livelihood is one of the priori thematic areas to enhance Food Security. The study conducted in Bale Mountain by Mebratu *et al* (2022) found that adoption of improved breeds and fodder production showed increment of milk yields by 40% and household income by 25% respectively. Similarly, in the practice of Zero grazing systems in Offla District brought meat production by 30% and increased the household food security (Elias and Yitbarek, 2023). Similar impact of improved livestock practice in Tigray was found from the study by Haftu (2019) that the practices helped farmers to reduce livestock loss by 20%. The study conducted in Western Lake Tana and Beles River watersheds replaced the in inorganic fertilizer by organic fertilizer from animal manure (Astewel *et al*. (2023). Besides, the integration of livestock in cropland contributed to sustainable land management as indicated in the study by Hailemariam *et al.* (2019) in the Nile basin of Ethiopia. Therefore, implementation of improved livestock in agricultural landscape has a rampant impact in improving the livelihood of the rural poor in Ethiopia. However, the less attention given to extension services, financial incentives is hindering to bring the desirable outcome from the practice.

Determinant of Climate Smart Agricultural Practice

Ethiopia has started implementing climate smart agriculture to respond to the negative effect of changing climate and build climate change resilient economy. However, there several factors determining the implementation and effectiveness of these practices. Under this review the key determinant bio-physical and socio-economic factors sourced from findings of different research articles are discussed.

Several research were conducted to identify the determinant factors for implementation and effectiveness of climate smart land management. Accordingly, the level soil erosion (Kindiye *et al*., 2023), status of soil fertility (Mekonnen *et al*., 2023) and trend of climatic variability (Melese, 2019) found as determinant factors that impact the implementation and effectiveness climate smart agriculture practices. In response to this, mare *et al*. (2020) recommended, adaptive land management strategies to consider local specific interventions to fit the changing environmental conditions.

As far as socio-economic factors are concerned, the result of different research identified the determining factors. Thus, access to credit and extension services (Kiros *et al*., 2019), land ownership (Astewel *et al*., 2023), educational status (Nugun *et al*., 2022), household size and income (Haron and Subir, 2020) were found significantly determining the decision of farmers to implement climate smart land management. A study by Haftu (2019) further added that less gender mainstreaming in intervention of the practices discourages to access resource there by promote low decision-making power.

Moreover, as study by (Tsega *et al*., 2018), found institutional arrangements are decisive for stimulating and supportive for climate smart agriculture effectiveness, which includes training with experience sharing (Nugun *et al*., 2022), research development initiatives (Kiros *et al*., 2019) and infrastructure development (Elias and Yitbarek, 2023). Availability of climate smart technologies such as drought resistant crops and irrigation and monitoring ability has determinant effects (Rusha Begna Wakweya, 2023).

The effective implementation of climate smart agricultural practices seek requires inclusive approach that integrates the multifaceted interplay of socio-economic and biophysical factors. The integration of these issues in implementation of the practices helps to bring about the desired positive impact in building climate resilient livelihoods.

Existing Research and the Knowledge Gaps

Several studies were conducted in different parts of Ethiopia. Krishna and Indris (2020) and Kim and Eichler (2021) studied the adoption of climate smart agriculture in Southern Tigray and in Ethiopia respectively including the applicability of these practice. However, these studies did not investigate the impact of these technologies on livelihood of the community. On the other hand, Ebabu (2023) examined the effect of land management practices on soil erosion and runoff in highlands of Ethiopia, while Ethiopia *et al*. (2022) and Simachew *et al*. (2023) conducted study in Tekeze basin and in Northeast high lands of Ethiopia respectively investigated drought propagation and level of vulnerability. Even though these studies provided insight about drought level but still separated thematically from climate smart agriculture and livelihood vulnerability. Moreover, Welde (2016) conducted research on land use management in Northern Ethiopia, particularly in Tekeze basin and Mengstu (2021) in Nile basin respectively but these studies pressed on soil and water management but not the impact of these practices on livelihood.

Meanwhile, studies such as Kiros *et al*2019; Nugun *et al*. (2022); Rusha BegnaWakweya (2023); Gebeyanesh *et al*. (2021) conducted research in different parts of the country and broadly discussed the contribution of climate smart agriculture to livelihood of the community while others researchers such as Haftu (2019); Astewel *et al*.(2023); Mebratu *et al*. (2022) found the factors for adoption of these practices but these findings are not related to the thematic areas of this thesis in terms of livelihood benefit from these practices. Besides, Kindiye *et al*. (2023; Sultan Mohammed *et al*., (2023); Dereje *et al*., (2019) emphasized primarily on biophysical aspect of climate smart agriculture which includes soil and water conservation without relating it with livelihood of the community. Therefore, these existing research results are related to land management, climate variability, climate smart agriculture and livelihood separately. Thus, this review attempted to fill the knowledge gap created from this research both in thematic areas, and integration of thematic areas.

Conclusion

The country's agriculture is under a serious challenge due to climate crises. As a result, the vulnerability of the livelihood is increasing, and calling for immediate action to create livelihood resilient communities. Creating climate resilient livelihood through climate smart agriculture offers hope to confront climate crises and bring about sustainable development.

The review found that implantation of improved land use management, livestock management, water resources management and soil and water conservation as part of climate smart agriculture measures have shown permissible impacts to build climate resilient livelihood through development of adaptive capacity of the community. However, wider adoption and effectiveness of these practices is dependent on the different factors.

The effectiveness of climate smart agriculture needs to understand the determinants factor. Successfulness of the practices is dependent on specific practices, local context and implementation strategies. Access to knowledge, market access, land tenure and institutional support and approach are identified as determinant factors for effectiveness of the practices.

Successful implementation of these practices at wider scale enhances fertile soil, abundant water, and crops yield; thereby build climate crises resilient livelihoods.

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4.2. Flood Vulnerability Zoning for Blue Nile Basin Using Geospatial Techniques

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Abstract

Flooding ranks among the most destructive natural disasters, impacting millions of individuals globally and resulting in substantial economic, social, and environmental repercussionstudy's objective was to create a comprehensive model that assesses the Nile River basin's susceptibility to flood damage and improves existing flood risk management strategies. Authorities responsible for enacting policies and implementing measures may benefit from this research to acquire essential information about the flood, including its scope and susceptible areas. The identification of severe flood damage locations and efficient mitigation techniques were made possible using geospatial data. Slope, elevation, distance from the river, drainage density, topographic witness index, rainfall intensity, distance from road, NDVI, soil type, and land use type were all used throughout the study to determine the vulnerability of flood damage. Ranking elements according to their significance in predicting flood damage risk was done using the Analytic Hierarchy Process (AHP) and geospatial approaches. The analysis finds that the most important parameters determining the region's vulnerability are distance from the river, topographic witness index, rainfall, and elevation, respectively. The consistency ratio (CR) value obtained in this case is 0.000866 (<0.1), which signifies the acceptance of the derived weights. Furthermore, 10.84m2, 83331.14m2, 476987.15m2, 24247.29m2, and 15.83m2 of the region show varying degrees of vulnerability to flooding—very low, low, medium, high, and very high, respectively. Due to their proximity to the river, the northern-western regions of the Nile River basin—especially those that are close to Sudanese cities like Khartoum—are more vulnerable to flood damage, according to the research findings. Furthermore, the AUC ROC curve demonstrates that the categorized vulnerability map achieves an accuracy rate of 91.0% based on 117 sample points. By putting into practice strategies to address the topographic witness index, rainfall patterns, elevation fluctuations, and distance from the river, vulnerable settlements in the area can be protected, and the impact of future flood occurrences can be greatly reduced. Furthermore, the research findings highlight the urgent requirement for infrastructure development and effective flood management strategies in the northern and western regions of the Nile River basin, particularly in proximity to major towns such as Khartoum. Overall, the study recommends prioritizing high-risk locations and developing a complete flood risk management plan based on the vulnerability map.

Key words*: Analytic Hierarchy Process, Blue Nile Basin, Geospatial Techniques, Flood Vulnerability, Multi-Criteria Decision Making*

Introduction

Flooding is one of the most devastating natural disasters, affecting millions of people worldwide and causing significant economic, social, and environmental consequences [1]. Therefore, selecting flood-prone area is one of the most significant choices in risk management ([2]; [3]; [4]). Floods have been occurring in different areas of the world and have significantly destroyed crops, buildings, infrastructure, and human lives [5]. Among the nations that are most susceptible to flood disasters are the Blue Nile basin regions, which are Ethiopia, Sudan, and Egypt [6]. The Blue Nile Basin is one of the world's largest river basins, with 85% of its water originated in Ethiopia.

It is used for hydroelectric generation, irrigation, agricultural development, and drinking water supply [7]. Although, the region is extremely vulnerable to recurrent flooding, which has an impact on infrastructure, ecological services, and people's means of survival [8]. As the region continues to experience rapid population growth, land-use change, and climate variability, it is essential to assess its flood vulnerability to inform disaster risk reduction and adaptation strategies [5]. There are different methods to assess flood vulnerability such as, remote sensing and GIS analysis, hydrological modeling, deep learning techniques, and MCDA [9].

In addition, for assessing flood risk, a variety of techniques have been used, including statistical methods [10], machine learning techniques [11], and hydrodynamic methods [12]. The multi-criteria decision-making approach (MCDA) technique is the most popular way of assessing complicated decision-making systems using a set of criteria. Exploring flood-inducing factors is important in the assessment of flood risk since floods typically result from a variety of causes. The choice of variables is influenced by the kind of flood, the size of the study area, etc. [13]; [14]; [15]. AHP has been widely used in multi-criteria analysis situations [16], where it has been acknowledged as one of the most useful subjective approaches proposed by standards [17].

The environmental vulnerability of floods can be assessed using geospatial approaches to analyze and map various factors [18]. The Blue Nile Basin's flood risk is studied utilizing Geospatial techniques to collect geographical data that can be examined in a variety of ways [19]. Geospatial techniques used to identify susceptible regions, calculate the potential effects of flooding, and create practical flood risk reduction plans [20].

Geospatial approaches have been used in numerous researches on assessing flood risk in various parts of the world ([21]; [20]; [22]). For instance, Sanyal & Lu (2005) assessed the flood susceptibility of the Gangetic West Bengal, India, using GIS and remote sensing [20]. Similar to this, Krishnamurthy & Krishnamurthy (2011) used GIS to examine how susceptible metropolitan areas in Mexico are to flooding [22]. Additionally, according Abd El-Hamid et al (2021) , assessment and forecasting of land-use/land-cover change surrounding the Blue Nile and White Nile owing to flood hazards in Khartoum, Sudan, based on geospatial analysis [5]. Also, a study by Astuti et al (2022) examined the spatiotemporal patterns of floods in the Lake Tana Basin using a mix of remote sensing, GIS, and hydrological modeling [23]. The study pinpointed flood-prone locations where climate change is predicted to result in increased flood threats in the future.

Thus, GIS-based multi-criteria decision analysis is an approach used in spatial analysis to assess and evaluate different alternatives or scenarios based on multiple criteria [24]. This approach combines geographical information systems (GIS) with decision analysis techniques to support decision-making processes in various fields. The Blue Nile Basin of Ethiopia's specifically in Fetam-Yisir watershed, Gizaw et al (2023) conducted using MCDA to determine the underground water potential [25]. Additionally, in the upper Blue Nile basin, Andualem & Demeke (2019) carried out a study on the groundwater potential zones utilizing GIS and MCDA methods [26]. As a result, geospatial-based multi-criteria decision analysis using AHP was chosen for this study's evaluation of flood risk.

Generally, geospatial techniques, including remote sensing and geographic information systems (GIS), are extensively used to quantify and map the impact of flood in the area [27]. Using geospatial approach, earlier research evaluated the Blue Nile Basin's flood susceptibility. But most of this research have concentrated on certain regions or sub-basins. The absence of thorough research covering the entire basin makes it difficult to determine how vulnerable the area is to

flooding overall and to create flood hazard reduction plans. Thus, the purpose of this research is to evaluate the Blue Nile Basin's flood susceptibility using geospatial approach to compare the results of earlier studies across the entire basin and this study will be used for the decision-makers to plan the strategies for flood-vulnerable areas pro-actively.

Finally, this study proposes applying geographic methods to evaluate the Blue Nile Basin's susceptibility to floods. By doing so, the study aims to contribute to better flood vulnerability assessment, mitigation, and adaptation strategies in the Blue Nile Basin. Accordingly, this research answers the following questions regarding the defined objectives:

1. *What is the spatial distribution of flood-prone areas in the Blue Nile Basin and how can remote sensing and geospatial techniques be used to accurately map these areas?*
2. *What is the level of vulnerability of the Blue Nile Basin to floods, as assessed by the AHP method?*
3. *What are the factors contributing to the vulnerability to flooding in the Blue Nile basin, and how can they be prioritized using AHP?*

Study Area

The Blue Nile basin is located between 31°57’48.7’’to 41°01’49.19’’ in East and 07°01’18.39’’ to 17°00’45.53’’ in North. And the location varies within the height of 329m up to 4266m above mean sea level as illustrated on (**Error! Reference source not found.**). The Blue Nile Basin c overs around 325,000 square kilometers and is in Ethiopia, Sudan, and Egypt. It is one of the largest river basins in the world, where 85% of the water originates from Ethiopia, is essential to the regions agricultural and water supplies. In addition to wildlife, it is home to a variety of ecosystems. However, the basin has challenges like pollution, resource competition, and scarce water, all of which call for cooperative efforts among the riparian nations and sustainable management.

Methodology

To assess and map the flood risk in the Blue Nile basin, several datasets with successively more clear procedures have been used. Using ArcGIS 10.3 and QGIS, the current study was conducted using AHP model in conjunction with RS and GIS in the geospatial approach. Including details about elevation, slope, rainfall, soil type, drainage density, topographic witness index, NDVI, distance to road and river, soil type, and land use. The datasets used in this research are described accordingly in (**Table**).

Table 1 Datasets used in the study

No	Datasets	Description	Source
1	Elevation	Download from SRTM	USGS Earth Explorer
2	Slope	Derived from DEM	USGS Earth Explorer
3	Rainfall	CHIRPS	CHIRPS high resolution[28]
4	Soil Type	Obtained from FAO 2012/2018	FAO 2012/18[29]
5	Drainage Density	Derived from DEM	USGS Earth Explorer
6	TWI	Derived from DEM	USGS Earth Explorer
7	NDVI	MODIS NDVI 2017	MODIS NDVI 2017[30]
8	Distance from Road	DIVA GIS	DIVA-GIS[31]
9	Distance from River	Derived from DEM	USGS Earth Explorer
10	Land Use	Download from Sentinel 2	Sentinel 2[32]

The research "Flood Vulnerability Zoning for Blue Nile Basin Using Geospatial Techniques" utilizes the Google Earth Engine (GEE) platform as its primary methodology. The study aims to assess flood vulnerability in the Blue Nile Basin region by integrating geospatial techniques and Earth observation data. Firstly, relevant satellite imagery and digital elevation models are sourced from GEE. These datasets are preprocessed and analyzed using advanced geospatial algorithms to identify flood-prone areas. Ten important parameters were considered in this study to determine the characteristics of the flood occurrence. Various vulnerability indicators such as Slope, elevation, distance from the river, drainage density, topographic witness index, rainfall intensity, and distance from road, NDVI, soil type, and land use type are then integrated to develop a flood vulnerability index. The index is classified into different vulnerability zones, allowing for effective flood management and mitigation strategies.

Different kinds of multi-source geospatial data were used for the Blue Nile River integrated basin flood risk mapping, as previously mentioned in (Table). All the spatial data were made radiometric and geometric correction and corrected for the projection coordinates system. Different RS and GIS software (QGIS and GEE) were used to process each of the adopted criteria together with the analytic hierarchy process.

Flood Vulnerability factors

By using the advice of experts, field observations, data availability, and literature reviews of previously published documents, the main criteria for flood contributing factors were identified. To analyze the hydrological processes related to flooding, this study considered flood vulnerability factors such as slope, elevation, distance from the river and road, drainage density, topographic witness index, rainfall intensity, distance from the road, NDVI, soil type, and land use type. Each of these elements is essential in evaluating how susceptible a region is to flood.

Elevation: The classification of the elevation into five classes of flood susceptibility based on elevation variations is done to ascertain the sensitivity of food. There are five different elevation

ranges: extremely high, very high, very low, and low. This classification aids in identifying the areas that are most at risk of flooding, allowing decision-makers to create efficient disaster management strategies and flood mitigation approaches to lessen the negative effects.

According to the flood risk factor, the elevations in the research region are divided into five classes: very high, high, moderate, low, and very low vulnerability to flooding, respectively, for elevations of 329–1200, 1200- 1635, 1635–2069, 2069–2503, and 2503–4266 m.

Slope Depend on slope inclination; the classes are created. Flat or gently sloping land is thought to have the lowest slope-inclined and is therefore less susceptible to flood. The steepest terrain, which is thought to be more prone to flooding, is indicated by the highest slope class ([5]; [31]; [32]). It is now simpler to ascertain the degree of flood sensitivity of a certain location or region, which is vital for evaluating future flood hazards and creating flood mitigation measures. The slope has been reclassified into five class based on the vulnerability of flood.

Similarly, according to the flood risk factor, the slopes are divided into five classes: very high, high, moderate, low, and very low sensitivity to flooding, respectively, for slopes of 0 to 15, 15 to 30, 30 to 45, 45–60, and >60 degrees as shown in. According to the study, locations with slopes of 60 degrees or more had a very low vulnerability to flooding, whereas those with slopes of 0 to 15 degrees had a very high susceptibility. This information can aid in successful disaster management by identifying regions that need flood control measures.

Distance from river: The river distance data are then divided into five types based on their range and given various properties. Once the classification is done, it can be further analyzed to identify the areas that are highly vulnerable to flooding ([33]; [32]; [34]). It can help in the preparation of evacuation plans, land use planning, and flood risk reduction.

According to the flood risk factor, the study area's distance from the river is categorized: areas less than 500 meters very highly susceptible to flooding, while areas 500-1000, 1000-2000, 2000-3000, and above 3000 meters from the river are classified as having high, moderate, low, and very low vulnerability to flooding, respectively as shown in.

Topographic Wetness Index (TWI) Based on the size and frequency of anticipated floods in the area, the topographic witness index assigns each locality to one of five categories, ranging from low susceptibility to high vulnerability. This measure has been shown to be successful in various studies and is a useful tool for managing and monitoring flood risk ([35]; [36]; [37]).Steps are

DEM → FILL → Flow direction → Flow accumulation → slop in degree → Rdian slop = (("slope" * 1.570796) / 90) → Tan slop = Con ("Radian_slope" > 0, Tan("Radian_slope"), 0.001) → Flow accumulation scaled = ("flow_acc4tr" + 1) * 30.98 → LN = Ln ("upslope" / "Tan_slope")

Based on the flood risk factor, the TWI in the study area is reclassified into five classes: 2.04-5.91 is low, 5.91-8.09 is very low, 8.09-10.18 is moderate, 10.18-12.63 is high, and 12.63-30.03is very high vulnerability to flooding as shown in

Drainage density (DD)*t*he DD was reclassified into five classes, ranging from very low to very high, according to their values. This enables more accurate identification of regions at risk of flooding and aids in guiding flood management and mitigation techniques (***[27]***; ***[31]***; ***[33]***).

Based on the flood risk factor, the DD in this study is reclassified into five classes: 0-2.5 is low, 2.5-4 is very low, 4-6 is moderate, 6-7.5 is high, and 7.5-114.3 is very high vulnerability to floods as illustrated in (

Rainfall Data The most important source of floods is rainfall because flood inundation results from massive runoff flows brought on by too much rainfall either a lot of rain or plenty of time rain (***[38]***; ***[31]***; ***[36]***). The data used to calculate the mean annual rainfall for the years between 2011 and 2020 is quantitative information that illustrates the amount of rain that has been measured in a particular place over a ten-year period. The annual amount of precipitation is measured utilizing satellites to gather this data. National weather agencies typically gather the data, which is then compiled into annual reports.

The mean annual rainfall is calculated by dividing the total amount of rainfall measured over the period of the ten years (2011-2020) by the total number of years. This provides an estimate of the potential yearly rainfall in the region.

In conclusion, the data used to calculate the mean annual rainfall for the years between 2011 and 2020 is quantitative data that depicts the typical quantity of precipitation in a Blue Nile water shadow during a ten-year period and reclassified into five class based on the flood risk factors. It is gathered using a variety of technologies and utilized for several things, such as predicting droughts, reducing flood risks, and planning agricultural operations.

The region has been reclassified as having contribution to flooding from 69.73–1338 mm is very low, 1338–1433 mm is low, 1433–1513 mm is moderate, 1513–1618 mm is high, and 1618–2097.56 mm is very high. The area means annual rainfall ranges from 69.73 to 2097.56 mm/year as shown in.

Distance from road the mapping of flood vulnerabilities is an essential step in reducing flood hazards in a region. Based on the flood risk factor from the distance between roads, flood-prone locations can be classified using five classes Diva GIS data studies (***[27]***; ***[36]***; ***[37]***). The steps listed below can be used to do this: In the beginning, we must get the Diva GIS data for the area of interest. The Euclidian Road distance between each place and the closest road can then be determined by extracting the road network layer from the data. Using the "Reclassify" option in the GIS software, we may reclassify the data into five categories based on the computed distances.

Within the study geographical area, locations 500 meters or less from the road are classified as extremely highly vulnerable to flooding; areas 500–1000, 1000–2000, 2000–3000, and >3000 meters from the road are classified as having high, moderate, low, and very low vulnerability to flooding, respectively as shown in.

The classification group in it five classes as: Class 1 – Lowest vulnerability (0 – 500 meters), Class 2 – Low vulnerability (500 – 1000 meters), Class 3 – Moderate vulnerability (1000 – 2000 meters), Class 4 – High vulnerability (2000 – 3000 meters), Class 5 – Very high vulnerability (above 3000 meters)

NDVI Normalized Difference Vegetation Index is a measurement of the amount and health of vegetation in a specific area based on the difference between the reflectance of near-infrared light and visible light and it is one of the factors used for determining flood susceptibility (***[37]***; ***[22]***; ***[25]***). NDVI values range from -1 to 1, with higher values indicating healthier and more abundant vegetation. NDVI is often used in remote sensing and agriculture to monitor changes in vegetation over time and to identify areas of stress or potential crop yields.

$$NDVI = \frac{\text{NIR}-\text{RED}}{\text{NIR}+\text{RED}}, \quad (1)$$

For this study MODIS NDVI 2017 data was obtained from NASA EOSDIS (Earth Observing System Data and Information System) in the official NASA website of Earth science data.

According to the flood risk factor in the research region, the NDVI are categorized into five classes: -0.2-0.29, 0.29- 0.38, 0.38-0.45, 0.45-0.51, and 0.51-0.59, which correspond to low, very low, moderate, high, and very high vulnerability to flooding as shown in.

Soil data For mapping flood hazards, soil data from the FAO (Food and Agriculture Organization) might be a significant resource ([39]; [38]; [40]). Important soil traits like texture, water-holding capacity, depth, and drainage potential are included in this report. These soil properties may have an impact on the amount of water a soil can hold before becoming saturated and the speed at which it may drain following a rainy event. Experts in mapping flood hazards can identify places that are more prone to flooding because of poor drainage or locations that are at a high risk of erosion by examining the soil data from FAO. This data can assist in the creation of flood hazard maps and assist local authorities and emergency services in identifying locations that could need special attention during a flood event. FAO soil data can be utilized for agricultural planning and management, environmental assessment, and natural resource management in addition to mapping flood hazards. Additionally, it can shed light on the soil's fertility, nutrient availability, and compatibility for crops.

In conclusion, the use of FAO soil data for flood hazard mapping can assist communities in better preparing for and responding to possible flooding occurrences, eventually lowering the risk of property damage and human injury. Based on the SWAT 2012 user soil type the data is classified in five classes as: clay_loam, loam, loamy_sand, clay, sandy_clay_loam, silt_loam, Land use land cover maps the mapping of flood hazards is an important process that involves identifying and designating regions that are susceptible to floods. Accurate flood hazard mapping may support the creation of flood mitigation plans and assist local governments in making defensible judgments about disaster preparedness and land use planning ([5]; [41]; [20]; [42]). The accuracy of mapping flood hazards can be significantly increased by using land use land cover (LULC) maps that are derived from Sentinel-categorized data. Sentinel-2 satellite imagery is a great source for constructing LULC maps since it offers high-resolution information on land cover and surface characteristics. Flood hazard maps that show the areas in danger of flooding under various scenarios can be made by superimposing data on local drainage patterns and watercourses over LULC maps. Sentinel-2's temporal data can also be used to identify locations that are vulnerable to flooding because variations in LULC can signal the possibility of greater runoff or decreased infiltration capacity. Overall, using LULC maps derived from Sentinel categorized data is an effective way to map flood hazards more precisely and intelligently. Local governments can better safeguard their areas and lessen damage from flood events by employing this technology.

One of the most important strategies for reducing the danger of flooding in the Blue Nile watershed is identifying flood hazards. Using hydrologic data, remote sensing methods, and LULC map data from Sentinel Classified Data, it is feasible to develop exact spatial models of expected flood occurrences, intensity, and potential effect.

The vulnerability to flooding in built-up regions, farmland, grassland, shrub land, and forestland areas was similarly classified in earlier studies by Hagos et al. (2022) as very high, high, moderate, low, and very low, respectively [39].

Different classes of land use have varying levels of susceptibility to flooding. For instance, low-lying areas such as wetlands and floodplains are more vulnerable to floods than higher elevation areas. Additionally, open spaces such as parks are less vulnerable than areas with impervious surfaces such as roads and buildings, which can contribute to increased runoff. Thus, a key factor in predicting the risk of flooding in each location is the type of land use. Similarly, the five categories of flood susceptibility shown on the LULC map of the research area in this study are: very high (urban area and water body), high (cropland and bare land), and moderate (grassland), low (shrubs), and very low (very dense vegetation).

Analytic Hierarchy Process (AHP)

The Analytic Hierarchy Process (AHP) is a method for making decisions that entails breaking down complex issues into more manageable components by organizing them into a hierarchical model. Using this strategy, a structured problem hierarchy will be created along with several decision criteria, sub-criteria, and options. The AHP approach is broken down into two parts. The first step is goal structuring, during which the decision-makers identify their primary objectives and supporting sub-objectives in a hierarchical manner. The second stage involves pairwise comparisons using a scale of relative relevance for each element and criterion at each level ([43]; [17]; [27]; [44]).

These, pairwise comparisons are converted via vector calculations by the AHP method into numerical weights. In other words, a final weight is determined for each alternative by combining the weights of the criterion and alternatives. The consistency ratio (CR), which measures whether the decision-makers were consistent in their pairwise comparisons, is used by the algorithm to assess the reliability of the judgments involved in the decision. The adaptability of the AHP is one of its benefits because it may be used to solve a variety of complicated problems, from socioeconomic to environmental ones. The method's strength is its capacity to handle both qualitative and quantitative data because it enables decision-makers to assess a problem in an organized fashion and compare the weight of criteria to better comprehend the decision's conclusion. The AHP approach is therefore useful in situations where multiple complex criteria are competing for attention, requiring deliberated decision-making based on their relative importance.

As proposed by Saaty (1987), the relative weights for each flood-controlling factors used in current study were determined using the following methodical procedures.

1. *To create the pairwise comparison matrix, each component was given a value between 1 and 9 based on its relative importance (**Error! Reference source not found.**). The scale s tates that 1 represents equal importance and 9 represents great importance.*

2. *Whereas the sums of columns will divide to column of the pairwise comparison matrix; the normalized pairwise comparison matrix table (**Error! Reference source not found.**) was c reated.*
3. *The normalized pairwise comparison matrix table's sum of each row was divided by the number of factors (in this case, eleven) to determine the weight of each factor (**Error! R eference source not found.**). The accuracy and consistency of the comparison were assessed using the following equations after the weight computations for each flood-controlling element. Equation (2) is used to determine the consistency index (CI), and it is provided by [17].*

Numerical algorithms describe the suitability of the careful influence on the creation of the contribution criteria and this influence reciprocally through various mathematical or logical techniques of resolving disagreement. The influence value range of 1 to 9 was assigned to each element to replicate the relationship outcome, considering the influence of factors on flood and expert opinions. The weighted linear combination technique was used to overlay each map layer in the final GIS spatial analysis for the flood vulnerable zone simulation. Making a pair-wise comparison matrix, with each row denoting the qualified relevance of one component to the other, was one of the main AHP process tasks. The relative relevance of the two characteristics was determined using a numerical scale from 1 to 1/9. In (**Error! Reference source not found.**) o utlined and ranked the relationships between a mathematical value and intensity of relevance on a scale from 1 to 9. ([40]; [45]; [43]; [46]; [17]). Five experts' opinions were compared pairwise in AHP to establish the weight of each sub-criterion. The weight of each expert was allocated separately, and the consistency ratio (CR) was evaluated. Once each expert's paired comparison table had established the acceptable CR, the average of the data from the five experts was computed to construct a single pairwise comparison table, establish the weights of each sub-criterion, and confirm the CR in AHP. The final pair-wise comparison AHP table (**Error! R eference source not found.**) was slightly modified with the result of five experts to complete the sub-criteria weights and achieve an acceptable CR. By the weighted linear combination technique, every map layer was overlaid in ultimate GIS spatial examination for flood-vulnerable zone imitation. The weighted linear combination system that was accepted with any of the GIS schemes has been superimposed. Therefore, the yield of the weighted linear combination technique provides a map replicated for the most part for prospective flood-vulnerable parts of the Fetam waters

Overlay analysis

Studies on mapping flood hazards frequently employ the GIS technique known as overlay analysis. Overlay analysis can be used to merge several geospatial information sources, such as river maps, rainfall data, slope data, and land use data, in the case of the Blue Nile watershed, to identify potential flood risk locations. The Blue Nile watershed's river map is the first dataset that can be used in the research. It is possible to determine the river's channel network and the locations most likely to experience floods during periods of severe precipitation using this data. Data on rainfall is the next set to consider because it may be used to predict the possibility and severity of a flood in a particular area.

Table 2 Safety scale for various elements comparison

Scale	Judgment of preference	Description
1	Equally important Two factors	equally contribute to the goal
3	Moderately important	Judgment and experience lean somewhat toward one another.
5	Important	Strongly significant are judgment and experience, favoring one over the other.
7	Very strongly important	Strong preference for one over the other based on experience and judgment
9	Extremely important	The strongest validity can be found in the evidence that supports one over the other.
2,4,6,8	Intermediate preference between adjacent scales	When yielding in is necessary

Source from [17]

Additionally, slope data can identify regions that may be vulnerable to severe erosion, which raises the risk of flash floods. The areas at risk of flooding because of anthropogenic activities like urbanization, deforestation, and agricultural practices can be identified with the aid of land use data, on the other hand. A flood hazard map for the Blue Nile watershed can be made by superimposing these datasets, showing the regions that are most vulnerable to floods. To lessen the potential harm from future flooding events, decision-makers can utilize the analysis to design and implement appropriate flood mitigation measures.

Results and Discussion

Result

This study aims to examine flood vulnerability in the Blue Nile Basin using geospatial techniques. The researchers will utilize GIS and remote sensing technologies to analyze spatial data such as elevation, rainfall, soil type, and drainage density, TWI, NDVI, distance from road, distance from river, soil type, and land use. By mapping and analyzing these factors, the researchers aim to create a flood vulnerability map for the Blue Nile Basin. The results of this study could have important implications for future flood management and disaster response efforts in the region.

Analytic Hierarchy Process

The heretical analytic hierarchy process called "flood vulnerability" aids in assessing potential flood hazards and vulnerabilities in each area. The frequency and severity of flood events are determined by considering a variety of parameters. The "heretic" nature of this procedure stems from the fact that it deviates from accepted flood risk assessment practices and makes use of cutting-edge tools and information sources. In the end, this strategy seeks to enhance flood mitigation and protection activities.

Random inconsistency indices (RI)Where, RI is the random inconsistenc index which was standard using (**Error! Reference source not found.**) and whose value depends on the number (n) of aspects being associated; for example n ¼ 6, RI ¼ 1.24 in Saaty (1987) standards [17].

Table 3 Random inconsistency indices

n	1	2	3	4	5	6	7	8	9	10
RI	0.00	0.00	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.49

Source from [17]

Pairwise comparisons of the factors

A statistical method used to compare the interaction between two factors is called a pairwise comparison. This approach pits two variables up against one another to see which has a bigger effect on the result. When working with multivariate data, pairwise comparison can be helpful since it allows one to isolate the association between two distinct components while adjusting for additional variables. Researchers can determine which component has a greater impact on the outcome of interest by comparing each factor individually. In conclusion, pairwise comparisons can be an effective technique for finding patterns and connections in large, complicated data sets. (**Error! Reference source not found.**) analyzes the study's pair-wise comparison

Table 4 Pairwise comparisons of the factors

Matrix		TWI	Elevation	Slope	Precipitation	LULC	NDVI	Distance from river	Distance from road	Drainage density	Soil type	normalized Eigenvector	principal
		1	2	3	4	5	6	7	8	9	10		
TWI	1	1	1	1	1	3	5	1	3	1	1		13.49%
Elevation	2	1	1	1	1	2	3	1	3	1	1		11.99%
Slope	3	1	1	1		3	1	1/2	1	1	1		9.98%
Precipitation	4	1	1	1	1	3	2	2	3	1	1		13.25%
LULC	5	1/3	1/2	1/3	1/3	1	1	1/3	3	1	1		6.7%
NDVI	6	1/5	1/3	1	1/2	1	1	1/5	1	1	1		6.04%
Distance from river	7	1	1	2	1/2	3	5	1	3	1	1		13.8%
Distance from road	8	1/3	1/3	1	1/3	1/3	1	1/3	1	1	1		5.77%
Drainage density	9	1	1	1	1	1	1	1	1	1	1		9.49%
Soil type	10	1	1	1	1	1	1	1	1	1	1		9.49%

Pair-wise comparison decimal matrixes

A tool used to assess and compare various options or criteria based on their relative relevance is a pair-wise comparison decimal matrix. Using a decimal rating system, the matrix enables side-by-side comparison of the options or criteria.

The top and left sides of the matrix list each choice or requirement. Each crossing point is given a decimal rating, with a value between 0 and 1 signifying the relative favor of one option or criterion over another. A rating of 1 denotes absolute preference for one option, while a rating of 0.5 denotes parity between the two options. Depending on how strongly one option is preferred to another, the decimals are assigned. The diagonal cells of the matrix are set to 1, signifying comparison of a decision or criterion to oneself.
Once each intersection point has been assigned a decimal value, the matrix can be used to assess and compare the options or criteria. The outputs of the matrix can be used as a decision-making tool or to rate options or criteria based on their level of importance.

Table 5 Pair-wise comparison decimal matrixes

Matrix	TWI	Elevation	Slope	Precipitation	LULC	NDVI	Distance from river	Distance from road	Drainage density	Soil type
TWI	1	1	1	1	3	5	1	3	1	1
Elevation	1	1	1	1	2	3	1	3	1	1
Slope	1	1	1	1	3	1	0.5	1	1	1
Precipitation	1	1	1	1	3	2	2	3	1	1
LULC	0.33	0.5	0.33	0.33	1	1	0.33	3	1	1
NDVI	0.2	0.33	1	0.5	1	1	0.2	1	1	1
Distance from river	1	1	2	0.5	3	5	1	3	1	1
Distance from road	0.33	0.33	1	0.33	0.33	1	0.33	1	1	1
Drainage density	1	1	1	1	1	1	1	1	1	1
Soil type	1	1	1	1	1	1	1	1	1	1
Sum	7.86	8.16	10.33	7.66	18.33	21	8.36	20	10	10

Normalized pairwise matrix calculated and Criteria weight

A decision matrix, also known as a normalized pairwise matrix, is a mathematical tool used to evaluate and compare multiple criteria or options. Each criterion in this matrix is ranked against each other using a set of numerical values that correspond to how significant or relevant each criterion.

The Eigenvector weights of each flood factor obtained after the pairwise comparison

Following pairwise comparison, the eigenvector weights of each flood factor show the proportionate weights that each element contributes to the overall flood risk. The eigenvector approach, which determines these weights by accounting for the interdependencies between all components, is used to calculate them.

Table6 Normalized pairwise matrix calculated and Criteria weight

Matrix	TWI	Elevation	Slope	Precipitation	LULC	NDVI	Distance from river	Distance from road	Drainage density	Soil type	Criteria Weight
TWI	0.13	0.12	0.10	0.13	0.16	0.24	0.12	0.15	0.10	0.10	0.1349
Elevation	0.13	0.12	0.10	0.13	0.11	0.14	0.12	0.15	0.10	0.10	0.1199
Slope	0.13	0.12	0.10	0.13	0.16	0.05	0.06	0.05	0.10	0.10	0.0998
Precipitation	0.13	0.12	0.10	0.13	0.16	0.10	0.24	0.15	0.10	0.10	0.1325
LULC	0.04	0.06	0.03	0.04	0.05	0.05	0.04	0.15	0.10	0.10	0.0670
NDVI	0.03	0.04	0.10	0.07	0.05	0.05	0.02	0.05	0.10	0.10	0.0604
Distance from river	0.13	0.12	0.19	0.07	0.16	0.24	0.12	0.15	0.10	0.10	0.1380
Distance from road	0.04	0.04	0.10	0.04	0.02	0.05	0.04	0.05	0.10	0.10	0.0577
Drainage density	0.13	0.12	0.10	0.13	0.05	0.05	0.12	0.05	0.10	0.10	0.0949
Soil type	0.13	0.12	0.10	0.13	0.05	0.05	0.12	0.05	0.10	0.10	0.0949

Higher weights indicate a bigger influence of the associated element on the overall flood risk. The weights are reported as a set of numbers ranging from 0 to 1 (**Error! Reference source not f ound.**). These weights can be used to prioritize mitigation activities by offering useful insights into the aspects of flood risk management that require the most attention.
Additionally, by highlighting the intrinsic interdependence of flood risk factors, the Eigenvector weights help decision-makers comprehend how actions taken to address one issue may have an impact on others. Designing integrated flood management techniques benefits from this element. Overall, the Eigenvector weights acquired through pairwise comparison offer a helpful foundation for comprehensively and successfully evaluating and managing flood risk.

Normalized pairwise matrix calculated and Criteria weight

A weighted criteria approach is used to assign relevance values to each criterion after the pairwise matrix has been built (**Error! Reference source not found.**). With the use of this criterion weight, w hich establishes the relative relevance of one criterion to another, options can be evaluated and compared using a scoring system.

The weight of the criterion is significant since it guarantees that all considerations are fairly considered during the decision-making process. Organizations can make wise decisions based on the critical variables that are most relevant to their goals and objectives by giving importance scores to each criterion. Without this weighting, decisions might be biased toward one or a small number of criteria, producing less than ideal result

Table 12 Normalized Weight and Influence

Matrix	Normalized Weight	Influence (%)
TWI	0.1349	13.49
Elevation	0.1199	11.99
Slope	0.0998	9.98
Precipitation	0.1325	13.25
LULC	0.0670	6.70
NDVI	0.0604	6.04
Distance from river	0.1380	13.80
Distance from road	0.0577	5.77
Drainage density	0.0949	9.49
Soil type	0.0949	9.49

Using a normalized pairwise matrix and criteria weight system together provides a comprehensive framework for evaluating and comparing options. It allows for objective decision making that considers all relevant factors, leading to better outcomes and more effective solutions**.**
Overlaid has been the weighted linear combination system that was approved for use with any of the GIS schemes. Consequently, the weighted linear combination approach result yields a map that is mostly repeated for potential flood-prone areas within the Blue Nile watershed.

The CI is determined as:

$$CI = \frac{\lambda - n}{n - 1} \qquad (2)$$

Where, n = number of factors (10) and,

λ = average value of the consistency vector determined in (**Error! Reference source not found.**).

λ= (10.0074+10.0083+10.02+10.0377+9.8507+10.0993+10+10.052+10.0105+10.0105) /10=10.0097

$$CI = \frac{(10.0097 - 10)}{(10 - 1)}$$

$$= 0.001074$$

The Consistency Ratio (CR), which evaluates the weightiness of the professional sight, was calculated using Equation (3). The result was presented in (**Error! Reference source not found.**).

$$CR = \frac{CI}{RI} \quad (3)$$

$$= 0.001074/1.24$$

$$= 0.000866$$

Consequently, the weights 0.1349, 0.1199, 0.0998, 0.1325, 0.0670, 0.0604, 0.1380, 0.0577, 0.0949, 0.0949 values were calculated for TWI, Elevation, Slope, Precipitation, LULC, NDVI, Distance from river, Distance from road, Drainage density, and Soil type, respectively. The resultant value of 0.000866 < 0.1 indicates that there was a realistic degree of consistency in a pair-wise comparison.

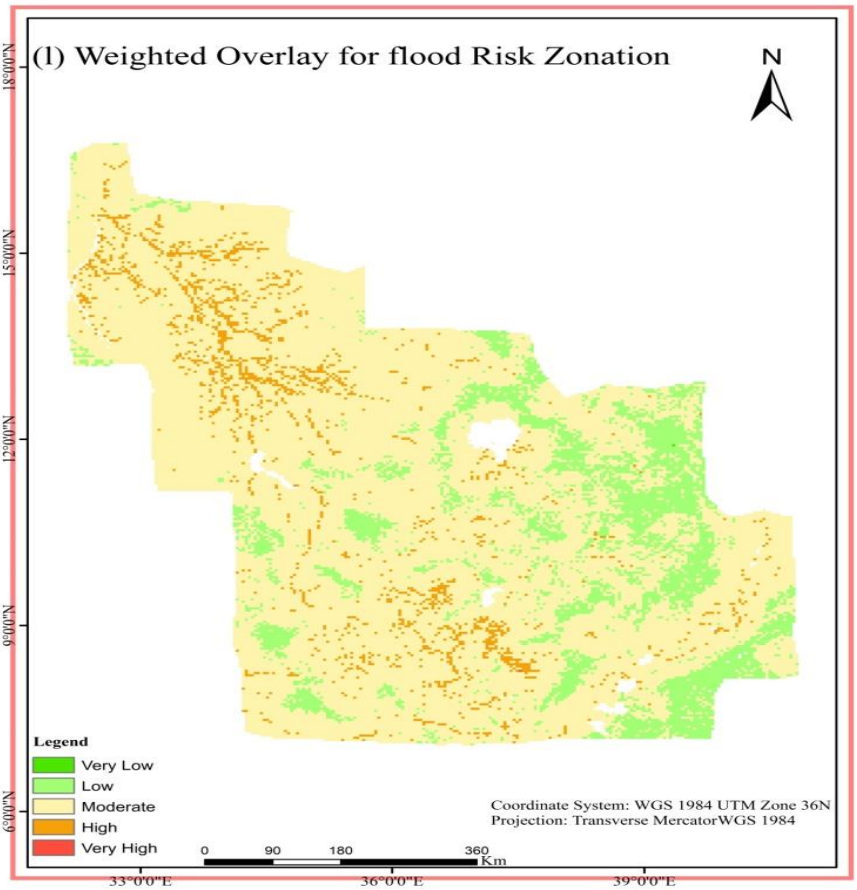
Table 13 Normalized pairwise matrix calculated and Criteria weight

Matrix	TWI	Elevation	Slope	Precipitation	LULC	NDVI	Distance from river	Distance from road	Drainage density	Soil type	Weighted sum	Criteria Weight	Weighted sum/ Criteria Weight
TWI	0.13	0.12	0.10	0.13	0.16	0.24	0.12	0.15	0.10	0.10	1.35	0.1349	10.0074
Elevation	0.13	0.12	0.10	0.13	0.11	0.14	0.12	0.15	0.10	0.10	1.20	0.1199	10.0083
Slope	0.13	0.12	0.10	0.13	0.16	0.05	0.06	0.05	0.10	0.10	1.00	0.0998	10.0200
Precipitation	0.13	0.12	0.10	0.13	0.16	0.10	0.24	0.15	0.10	0.10	1.33	0.1325	10.0377
LULC	0.04	0.06	0.03	0.04	0.05	0.05	0.04	0.15	0.10	0.10	0.66	0.0670	9.8507
NDVI	0.03	0.04	0.10	0.07	0.05	0.05	0.02	0.05	0.10	0.10	0.61	0.0604	10.0993
Distance from river	0.13	0.12	0.19	0.07	0.16	0.24	0.12	0.15	0.10	0.10	1.38	0.1380	10.0000
Distance from road	0.04	0.04	0.10	0.04	0.02	0.05	0.04	0.05	0.10	0.10	0.58	0.0577	10.0520
Drainage density	0.13	0.12	0.10	0.13	0.05	0.05	0.12	0.05	0.10	0.10	0.95	0.0949	10.0105
Soil type	0.13	0.12	0.10	0.13	0.05	0.05	0.12	0.05	0.10	0.10	0.95	0.0949	10.0105

Vulnerability Map

By analyzing spatial data from multiple sources including elevation, rainfall, soil type, drainage density, topographic wetness index, NDVI, distance to road and river, soil type, and land use, the study will generate a comprehensive and accurate flood vulnerability map. The map will aid in locating the basin's most vulnerable places and serve as a tool for policymakers as they create plans to lessen the effects of flooding. The vulnerability map can also be used to help plan for disaster preparedness and response, as well as to help allocate resources for disaster risk reduction to the regions that most need them. Overall, the vulnerability map as shown is a crucial tool for ensuring the Blue Nile Basin's water resources are managed sustainably.

Fig 2 Flood Vulnerability Map: l) Weighted Overlay for flood Risk Zonation



Validation of flood susceptibility map

117 flood spots in the Blue Nile basin were identified for susceptibility map validation using data from Google Earth, NASA Socioeconomic Data and Applications Center, news, and historical records. Using the validation datasets, the flood susceptibility map presented in (**Error! Reference s ource not found.**) was validated using the receiver operating characteristic curve (ROC) curve to assess the model's precision. In ROC, the X-axis represents the false positive rate and the Y-axis the true positive rate. Every prediction model's accuracy is expressed as the area under the curve (AUC). AUC values typically fall between 0.5 and 1, with values nearer 1 denoting higher model accuracy. The model's accuracy in this investigation was 91.0%, demonstrating its good and reliable performance in creating a flood vulnerable map [47].

Discussion

The analysis of flood damage susceptibility in the Nile River Basin utilizing geospatial techniques and the analytic hierarchy process offers important insights into the management of flood risk. The

study's main conclusions imply that identifying factors can assist in analyzing flood damage risk, including slope, elevation, topographic witness index, drainage density, distance from the river, NDVI, distance from the road, soil type, land use, and rainfall intensity.

The study confirms earlier research Lee et al (2018) that emphasizes the significance of geographical evaluation of urban flood susceptibility using data mining and geographic information system (GIS) techniques [48]. Prioritizing elements and analyzing their contributions to the most significant impact on flood damage risk were made possible by the analytic hierarchy process (AHP) technique utilized in the study. The Nile River Basin's susceptibility was most significantly influenced by distance from the river, followed by the topographic witness index, rainfall, and elevation. This finding is consistent with earlier research (Abdel Hamid et al (2020) , which discovered that river proximity is one of the major factors affecting flood hazard vulnerability [49].

Distance from river and rainfall intensity was shown to be the two top-ranking criteria in the study. According to earlier research Adelekan (2010), population density and rainfall intensity are the two factors that most significantly affect flood damage risk [42]. This finding conflicts with that research because; the population density is not considered in this study.

The study's results also corroborate other studies that emphasize the importance of geographic information systems (GIS) and remote sensing as key instruments for determining flood risk. In a similar study on the Hugli River Basin's flood vulnerability assessment, for instance, Das and Gupta (2021) concluded that remote sensing and GIS techniques are essential for mapping and analyzing flood hazards. In their research to lower flood risks, Das and Gupta (2021) also underline the significance of data-driven modeling and the development of an integrated flood management strategy [31]. This is in line with the findings of the current study, which evaluated flood susceptibility in the Nile River basin using a similar methodology.

The research's use of geospatial technologies and data allowed for excellent data management, integration, and analysis, which aided in the identification of regions with considerable flood damage and practical mitigation tactics. According to the study's findings, more than 4% of the Nile River Basin is vulnerable to flooding, the area which existed near to Khartoum. This finding is in line with earlier research by Robi et al (2019), which found that the Nile River Basin was at an elevated risk of flood damage [50].

The Northwest Nile River Basin, which is adjacent to Sudanese cities like Khartoum, is at a high risk of flooding damage because of the river's proximity to the area, according to the report. Furthermore, even while locations farther from the river are less likely to experience flood damage, they are still at risk when it rains heavily. This finding supports prior research by Abd El-Hamid et al (2021) that found areas near rivers and streams are more susceptible to flooding [5].

In contrast, the study also discovered certain outcomes that ran counter to other studies. For instance, several earlier research imply that variables like land use and soil type considerably influence the susceptibility to flood damage. Similar conclusions are found in Rahman et al (2021) study on the vulnerability of flood damage in the Meghna river basin [51]. These factors did not, however, score as highly in the current study in terms of their impact to the sensitivity to flood damage. The differences in findings may be due to differences in the study areas and the methodologies used. The current study used geospatial methods and the analytic hierarchy process, which may offer more nuanced insights than the methods used in some of the earlier studies.

Conclusion and Recommendation

Conclusion

It is evident that this method offers helpful insights into flood risk management after completing substantial research on analyzing the susceptibility of flood damage in the Nile River basin utilizing geospatial methodologies and analytic hierarchy process. The goal of this work was to create a thorough model that evaluates flood damage vulnerability and enhances current flood risk management techniques. To rank the elements by their significance in forecasting flood damage vulnerability, different geospatial data sets were examined.

A lot of factors influence how susceptible flood damage is in the Nile River Basin, the study also revealed. There are many of these variables, including slope, elevation, topographic witness index, drainage density, distance from river, NDVI, distance from road, soil type, land use, and rainfall intensity. The findings indicate that locations north of the Nile River in the Nile River Basin, including those around Sudanese cities like Khartoum, are at a high risk of flooding. Additionally, even while places farther from the river are less likely to experience flood damage, they are still in danger in the event of intense rain.

The results showed that the distance from the river, TWI, and rainfall contributed 13.8%, 13.49%, and 13.25% of the flood, respectively, while elevation, slope, drainage density, and soil type accounted for 11.99%, 9.98%, and 9.49%, 9.49% of the flood. Extremely high and low flood potential zones covered relatively small areas in the flood susceptibility map due to the extremely high and low influence of each of the 10 contributing variables. The main factors were rainfall, TWI, and the distance from the river. Similarly, almost all local administrative entities and most of the Nile River basin beyond the riverfront were located inside the moderate flood potential zone. The two primary contributing causes to the zone of moderate flood potential were land use change and NDVI.

The study's findings indicate that 10.84 m^2 has a very low risk of flooding, whereas 83331.14 m^2 has a modest risk, 476987.15.83 m^3 is a very high vulnerability to flooding, 24247.29 m^3 is a high vulnerability, and 15 m^3 is a medium vulnerability. Moreover, the AUC ROC curve shows that the categorized vulnerability map has a 91.0% accuracy rate utilizing 117 sample points. Policymakers and implementing authorities may find this research useful to obtain fundamental facts about the flood, such as its extent and vulnerable regions. Evaluate Flood Vulnerability Regional evaluations of flood susceptibility may yield precise flood potentiality at the local level, according to AHP methodologies.

The study also found that considerable flood damage occurs in the Nile River watershed because of changing climate patterns, as well as human settlements near to the river, urbanization, and changes in land use. This study created a vulnerability map to aid in developing mitigation strategies and used spatial analysis to identify the area’s most at risk for flooding damage. The study's findings emphasize the value of using analytic hierarchy process and geospatial tools to mitigate flood risk. Policymakers can identify regions at high risk of flooding damage and prioritize mitigation actions with the help of the study's findings. By identifying the most significant elements influencing flood damage risk in the Nile River Basin, the research adds to and expands on the body of prior research.

The identification of locations with significant flood damage and the creation of effective mitigation strategies were made possible using geospatial data and methods for effective data

management, integration, and analysis. This study illustrated the usefulness of geospatial techniques in evaluating flood damage sensitivity by applying geographic data stacking, hotspot analysis, and proximity analysis. Thus, the study has shown how geospatial techniques mixed with AHP can be applied to assess an area's vulnerability to flood damage and pinpoint regions in need of enhanced mitigation strategies. The study's conclusions offer a critical framework for future investigations into flood risk management and function as a manual for choosing an integrated flood control approach.

Recommendations

Considering its objectives, which include identifying and mapping the flood-prone zones in the Blue Nile basin, assessing the area's level of vulnerability to flooding, and pinpointing the contributing factors, the study makes the following recommendations:

1. *To identify and map the flood-prone areas of the Blue Nile Basin, it is critical to consider enhancing data collection and analysis techniques through the integration of geospatial, satellite-based modeling, and sensor-based observations. This will increase clarity and enable more precise identification of flood-prone areas.*
2. *To identify the contributing factors that, when linked with AHP, give the Blue Nile Basin susceptible to floods, social and economic concerns must be considered. These can include geomorphology, infrastructure development, land use style, and economic activity. Combining these factors helps produce a more thorough map of flood susceptibility, as they can significantly impact the basin's flooding vulnerability.*

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4.3. Evaluation of Land Surface Temperature: The Case of Addis Ababa City and Its Neighboring, Ethiopia

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Abstract

The rise in surface temperature over the 21st century is one of the major effects of climate change in metropolitan areas. The primary element of the earth's surface that interacts simultaneously with the lithosphere and atmosphereis LULC. So, this research aimed to predict land surface temperature using geospatial techniques from the year 2017 to 2021, in case of Addis Ababa city and its neighboring Zones, Ethiopia. Land use land cover data were used from sentinel, Land surface temperature was retrieved from MODIS. Linear regression and zonal statistic were used for statistical analysis and value extraction respectively. The classification contains seven land use class types, namely bare land, built up, crop land, flooded vegetation, rangeland, vegetation, and water. Built-up was increased from the year 2017 to 2021 significantly whereas, crop land was decreased dramatically. The NDVI and LST results show noticeable declination for the study period. The NDVI and Agro-climate zone had inversely related with LST. Different land use /land cover class showed to have different land surface temperature result. These data shed light on the dynamics of land use/ land cover, NDVI (vegetation), agro climate region, and land surface temperature patterns in the research area. In addition, this study illustrates the variability in LST across various land coverclasses, agro climatic areas, throughout the study years. It sheds light on how elevation, vegetation indices, and land cover changes affect temperature patterns. The study emphasizes how crucial it is to monitor and comprehend these variables to effectively manage the land, plan it, and promote sustainable development in the study area and other nearby locations.

Keywords: *Agro climatic zone, Land surface temperature, land use land cover, Normalized difference vegetation index*

Introduction

Rapid urbanization is currently a problem in many emerging nations, which could threaten the sustainability ofurban regions (Marland et al. 2003). Rising surface temperatures in the 21st century is a significant consequence of climate change in urban areas, with heat waves affecting specific population groups in various cities around the world. Although this phenomenon is mainly due to man-made features, various natural land covers also contribute to changes in surface temperature (Neway Kifle et al 2021). The term "land-use/land-cover change" (LU/LCC) describes how human activities have altered the earth's surface (Kassahun Gashu and Tegegne Gebre-Egziabher, 2018). The primary element of the earth's surface that interacts simultaneously with the lithosphere and atmosphereis LULC (John et al.2020). The proportionate increase in LST depends on LULC change, particularly in urban areas, according to several studies that found a significant influence of LULC on surface temperature (Tafesse and Suryabhagavan 2019).

For urban land management decisions, ecosystem monitoring, and urban planning (John et al. 2020; Tafesse and Suryabhagavan 2019), accurate and timely information regarding the land cover in urban and rural areas is essential. It is acknowledged as a well-established technology for

delivering appropriate information on land use, land-cover mapping, and sustainable management of land and natural resources that the integration of satellite remote sensing and geographic information systems (GIS) is possible (Yin et al. 2020).

Built-up areas with a variety of land uses in commercial, institutional, and residential regions make up urban space.It also includes a non-built area, which primarily shows that green spaces are present in built-up regions and are covered in either natural or artificial vegetation. But there is still debate over the term that is generally accepted. Most wealthy nations have their report (Kassahun Gashu and Tegegne Gebre-Egziabher, 2018).

The amount of non-evaporating surfaces has increased, while the amount of vegetation has decreased, changing the temperature (John et al. 2020). Remote-sensing techniques were found to be efficient, especially in reducing the time for analysis of urban expansion, and are useful tools to evaluate the impact of urbanization on LST (Deng et al. 2018; Tafesse and Suryabhagavan 2019) .This study evaluates the use of Landsat TM, ETM+, and OLI/TIRS data's for indicating temperature differences in urban and rural areas to analyzing and assess the impact of factors that affect land surface temperature.

Over time, changes in land use and land cover have caused quick changes in the ecosystem and accelerated environmental degradation (Sahile 2021). These issues are frequently linked to rapid population increase (Neway Kifle Bekele, Biniam Tesfaw Hailu, and Suryabhagavan 2022). Urbanization and population growth bring to widespread LULC shifts and seasonal instability, which leads to an increase in temperature (Sahile 2021). Smaller cities and villages will experience most of the urban expansion over the next 25 years. Even though they only make up a small portion of the planet's geographical area, metropolitan areas have had a substantial impact on the environment, ecosystems, and society due to their fast expansion (Nigussie Haregeweyn et al. 2012). Urban environments and their quality are of importance as urbanization rises and urban areas continue to expand quickly since they have a direct impact on the social and economic health of the city (Kassahun Gashu and Tegegne Gebre-Egziabher, 2018).

Urbanization is thought to be a major contributing cause for the shift in the temperature of the land. The rate of urbanization, land use patterns, and building density all has a direct impact on LST intensity (Mustafa et al. 2020). Most studies that have examined the relationship between land use/land cover (LU/LC) and land surface temperature (LST) in Addis Ababa and its surrounding areas have found that urbanization, particularly the expansion of built-up or paved areas, is the main factor driving land use and land cover change. Once more, this may lead to an increase or decrease in land surface temperature. Most researchers in the field of research have explored this issue. The researcher wanted to vary the parameters and analyze the results.

The component was selected based on the diverse agro-climatic, rural, and urban zones in the research area. Given that Addis Ababa is the most populous region in Ethiopia, expanding the geographical scope to include both urban and rural areas would illustrate the relationship between land use/land cover (LU/LC) and land surface temperature (LST). Considering different agro climatic regions can also assist in establishing a clear connection. Considering the foregoing, the researcher attempted to demonstrate.

The study area has different agroclimatic zones and land use land covers. It contains different land scape including urban and rural. Therefore, the researcher evaluated the impact of topography, agro-climatic zone, LU/LC, and other indexes on land surface temperature during the study period of the study area aiming to evaluate land surface temperature using geospatial techniques from the year 2017 to 2021, in case of Addis Ababa city and its neighboring Zones, Ethiopia.

Methodology

Study Area Description

The stud area covers east Shewa, west Shewa, southwest Shewa, north Shewa and Addis Ababa city. The study has total area of 43364.495 Km^2 or more than 4.3 million hectares. Geographically the study area is suited between 860000 to 1200000m latitude to the north to 290000 to 620000m Longitude to the east (Figure 1**).**

4.3.1. Secondary data

As secondary data sources in (Table 1), the Central Statistical Agency (CSA) of Ethiopia provided shapefiles containing attributes of administrative boundaries, roads, and rivers. The MODIS LST data products of MOD11A2 version 6, which provide 1 km 8 days spatial and temporal resolution imagery respectively, and MODIS NDVI product (MOD13Q1) 16-day 250 m resolution data, were freely downloaded from the Earth Data website. Sentinel _2, 10 m resolution land use land cover data were taken from w.https://www.arcgis.com/apps/instant/media/index.html?id=fc92d

A DEM with a resolution of 12.5 meters was additionally acquired and used for the study from NASA Earth datawebs

DEM	12.5m	https://earthdata.nasa.gov/eosdis/daacs/asf

Land use land cover classification

In 2020, a study conducted by Esri, Microsoft, and Impact Observatory classified land use and land cover into seven categories, which include bare land, built up areas, crop land, flooded vegetation, rangeland, vegetation, and water. The classification of water areas encompassed places where water was continuously present throughout the year but did not include regions with sporadic or ephemeral water, sparse vegetation, rock outcrops, or built-up features like docks. The vegetation classification included areas with tall and dense vegetation with a closed or dense canopy.The flooded vegetation classification included regions where plants intermingle with water for most of the year,such as flooded mangroves, emergent vegetation, and heavily irrigated agriculture. Crop land, however, was designated for human-planted cereals, grasses, and crops. Built-up areas included human-made structures like residential housing, office buildings, and parking structures, while bare land was categorized as regions with little to no vegetation. Lastly, rangeland encompassed areas with homogeneous grasses and little, taller vegetation, and sparse clusters of plants or single plants dispersed throughout a landscape showing exposed soil or rock.

NDVI

The Normalized Difference Vegetation Index (NDVI) for the years 2017 to 2021were taken from earth website. It was added in to arc map and later multiplied by scale factor which is 0.0001 using raster calculators. Finally, the three years NDVI were mapped together. NDVI value ranges between -1 and +1 and it enhances all vegetation and resulting in a positive value. Soil may have a nearby zero value, while water body features have negative values (John et al. 2020; Neway Kifle Bekele et al. 2022)

Agro_ climatic zone

The Agro_ climatic zone was computed using DEM (altitude classification method) (Dixon 2003).

According to Natural Resources Management and Regulatory Department with the Support of:

German Agency for Technical Cooperation (GTZ) in 1998, the Traditional Agro_ climatic zone of Ethiopia ranges from 0 to 500 is Bereha, 500 to 1500 is Kola, 1500 to 2300 is Woina Dega 2300 to 3200 is Dega and above 3200 is Wurch. So, the Agro climatic zone off the study area is calculated from DEM of Ethiopia (figure 2).

LST

The MODIS LST was downloaded from the Earth Data website, and the LST was generated using Arc mapsoftware. After the LST were taken from web sites multiplying by scale factor (0.02) were the first task. Conversion from hdf to .img conducted from the years 2017 to 2021. In raster calculator changing from degree kelvin into degree Celsius by subtracting 273.15 was conducted. And at the end the LST for the year 2017, 2019 and 2021 wereestimated and mapped.

Statistical analysis

A correlation analysis describes the linear relationship between two or more variables (land surface temperature (Neway Kifle Bekele et al. 2022) with NDVI, and the Elevation) (Sahile 2021). Using a numerical statistic called a Pearson correlation coefficient; we may show the relationship between two variables. Positive and negative linear correlations between NDVI, and the Elevation with LST (Mekasha, Suryabhagavan, and Kassawmar 2021). The Pearson correlation coefficient (r) would be utilized to correlate the LST acquired from remote sensing with NDVI, and Elevation. 1041 random points were generated. Using those points extract value from NDVI, Elevation and LST were done. Later, using those values person correlation was performed.

According to the Pearson correlation coefficient values we can say that strongly correlated if it lies between 0.50 and 1, a medium correlation between 0.30 and 0.49, and a weak correlation between 0.30 and 0 (Neway Kifle and Binyam Tesfaw 2021). The Pearson correlation coefficient value (r) would be calculated using the empiricalrelationship shown below:

$$r_{xy} = \sum_{i=1}^{n} (xi - \dot{x})\,(yi - \dot{y}) / \sqrt{\sum_{i=1}^{n} (xi - \dot{x})^2 - \sum_{i=}^{n}}$$

On the other hand, Zonal statistics was used to compute the relation between LU/LC in the agro-climatic zone with LST. Resampling was used in DEM VS LST from 12.5 to 1000 m, NDVI VS LST from 250 to 1000m, and LU/LC VS LST from 10 to 1000m.

Results and Discussions

Land use land covers classification, NDVI, Agro-climatic region, LST Retrieval and Statistical analysis

Land use land cover classification

Table 2 and Figure 2 depict the land cover classification results during 2017, 2019, and 2021 in the study areas. The data is presented in two columns, one for the area in hectares and another for the percentage of the total area. The types of land cover are bare land, built-up, cropland, flooded vegetation, rangeland, vegetation, and water.

In 2017, the total area was 4336449.5 hectares, and the land cover was distributed as Bare land: 6295.5 hectares (0.1%), Built up: 206463.8 hectares (4.8%), Cropland: 2896204.4hectares (66.8%), Flooded vegetation: 2434.8 hectares (0.1%), Rangeland: 850478.5hectares (19.6%), Vegetation: 356789.1hectares (8.2%) and Water:15766.5hectares (0.4%).

In 2019 the total area remained the same, but the land cover changed as Bare land: 6175.7 hectares (0.1%), Built up:217575.9 hectares (5.0%), Cropland: 2895806.2 hectares (66.8%), Flooded vegetation: 2374.6 hectares (0.1%),

Rangeland: 860638.3 hectares (19.8%). Vegetation: 337579.0 hectares (7.8%) and Water: 14477.5 hectares (0.3%). Similarly, in 2021, the total area remained the same and the land cover changed again as Bare land: 6027.3 hectares(0.1%), Built up: 272288.2 hectares (6.3%), Cropland: 2838483.3 hectares (65.5%), Flooded vegetation: 2204.6

hectares (0.1%), Rangeland: 905900.4 hectares (20.9%), Vegetation: 295482.3 hectares (6.8%), Water: 14567.5 hectares (0.3%)

Table 2 LU/LC Classification results of the study period

LU/LC Class Name	2017	percent	2019	percent	2021	percent
Bare Land	6295.5	0.1	6175.7	0.1	6027.3	0.1
Built Up	206463.8	4.8	217575.9	5.0	272288.2	6.3
Crop Land	2896204.4	66.8	2895806.2	66.8	2838483.3	65.5
Flooded Vegetation	2434.8	0.1	2374.6	0.1	2204.6	0.1
Rangeland	850478.5	19.6	860638.3	19.8	905900.4	20.9
Vegetation	356789.1	8.2	337579.0	7.8	295482.3	6.8
Water	15766.5	0.4	14477.5	0.3	14567.5	0.3
Total	4336449.5	100.0	4336449.5	100.0	4336449.5	100.0

NDVI

The findings in (Figure 3) depicted the NDVI's (Normalized Difference Vegetation Index) maximum and minimum values for three distinct periods (2017, 2019, and 2021). By measuring the difference between the visible and near-infrared light reflected by plants.

In 2017, 2019, and 2021, the greatest NDVI values were 0.870, 0.868, and 0.852, respectively. This suggests that throughout these years, plant growth was at its highest and near-infrared light reflectance was higher than visible light reflectance, suggesting healthy vegetation. Additionally, it is important to note that the maximum NDVI valueshave decreased through time, with the greatest value recorded in 2017.

On the other hand, during the years 2017, 2019, and 2021, respectively, the minimum NDVI values were -0.188, - 0.192, and -0.247. Negative NDVI values signify a low plant cover, a lack of vegetation, a lack of human-made landuse, or both in the target region.

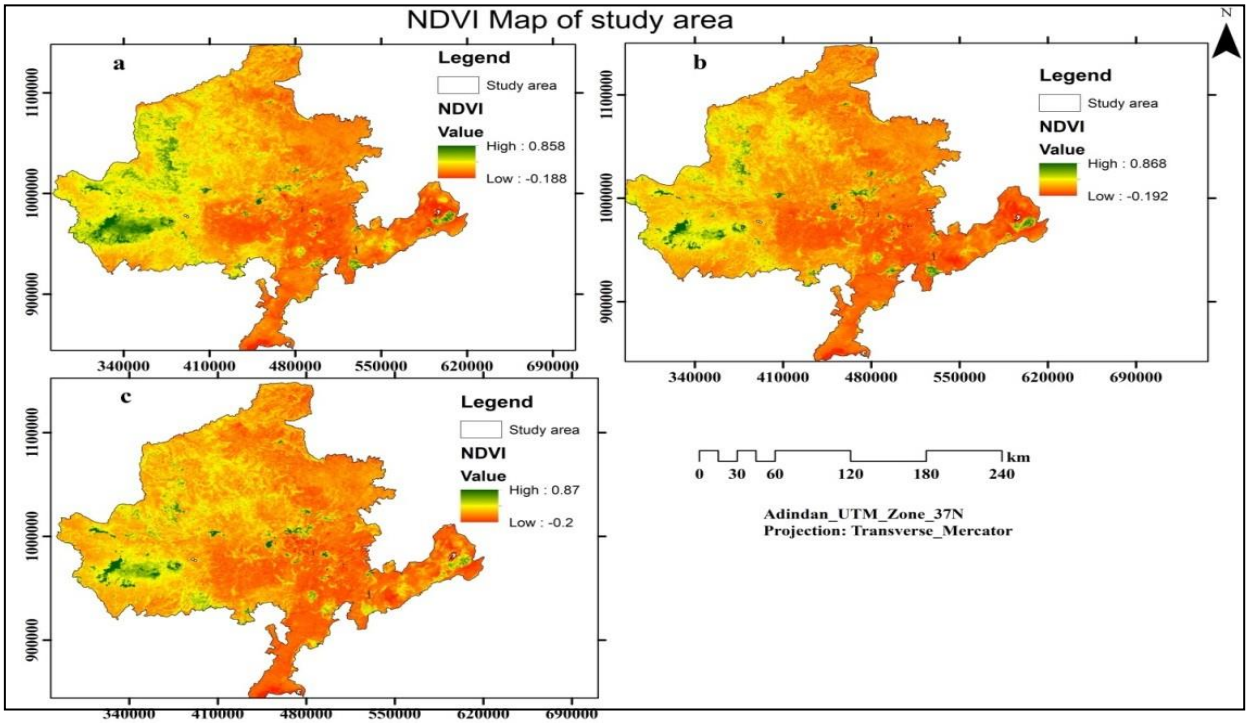


Figure 3 NDVI maps of a) 2017, b) 2019 and c) 2021

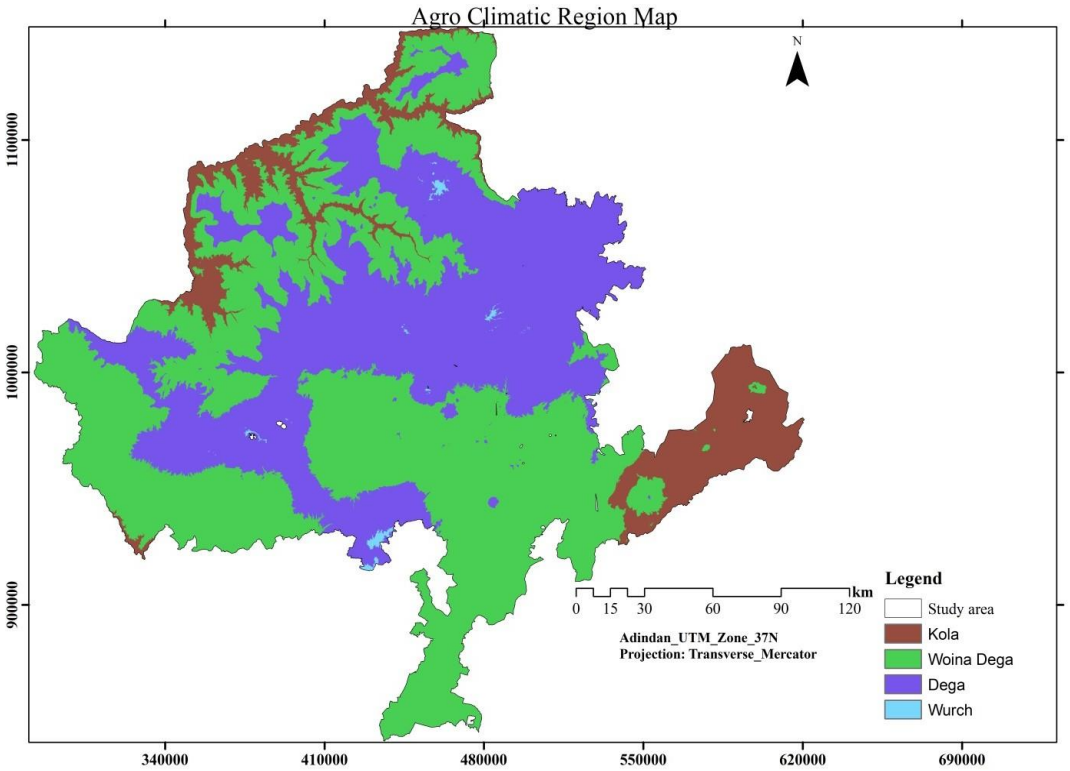
Agro-climatic zone

Table 3 and Figure 4 show the study area agro-climatic zone which lies between Wurch to Kola. The Woina Dega shares the maximum area of 2232203 hectares followed by Dega 1614262.5 hectares from the total area of the studyarea. In another way, the minimum area goes to wurch 12038.52 hectares followed by Kola 477861.24 hectares.

Table 3 Agro climatic region area

Agro climatic region	Area(ha)
Kola	477861.24
Woina Dega	2232203
Dega	1614262.5
Wurch	12038.52

Figure 4 Agro-Climatic Region of the study area

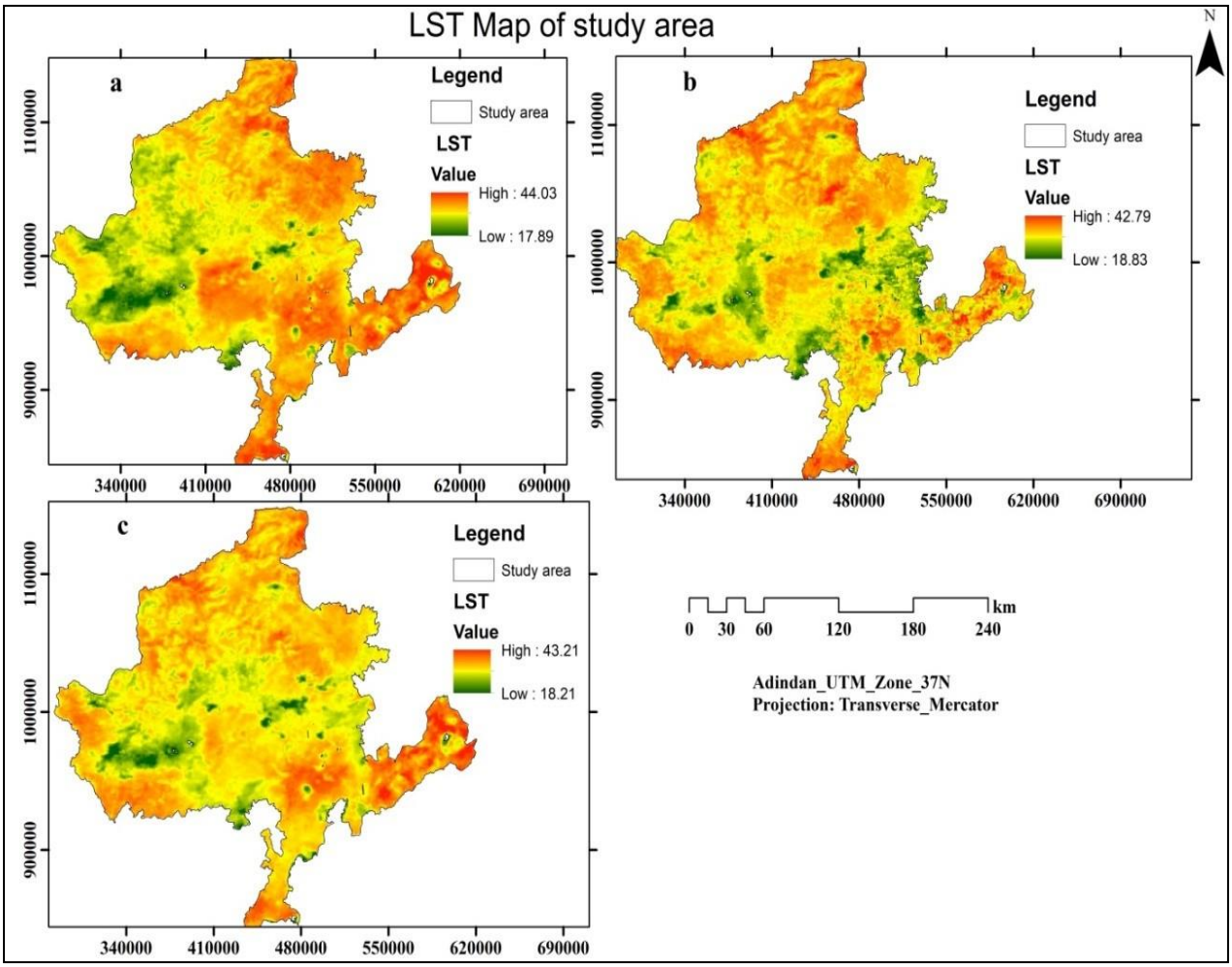


LST Retrieval

The research conducted aimed to investigate the land surface temperature (LST) of a specific study area during the years 2017, 2019, and 2021. The LST values were calculated to determine the maximum and minimum temperaturesof the area during the mentioned years. The result in (Figure 5) shows that the minimum and maximum LST values were recorded during the study period, and there were diverse temperature patterns in different parts of the area.

The maximum LST values recorded were 42.79 °C, 43.21 °C, and 44.03 °C in 2017, 2019, and 2021, respectively.These high maximum temperatures were observed in the peripheral parts of the study area compared to other parts. Additionally, in 2017, 2019, and 2021, respectively, the minimum LST values were 17.69 °C, 18.21 °C and 18.83°C.

Figure 5 LST maps of a) 2017, b) 2019 and c) 2021



Statistical Analysis

LULC Vs LST

The result shows in (Table 4) the mean LST of different types of land cover classes, including bare land, built-up, cropland, flooded vegetation, rangeland, vegetation, and water in three different years, 2017, 2019, and 2021. The analysis indicates that there are variations in land surface temperature in different land cover classes throughoutthe years.

The mean LST value for Bare land was 31.21°C for the year 2017, 32.95°C in 2019, and 34.35°C for the year 2021 indicating that bare land had bit decreased through time. On the other hand, for the built-up the LST was, 32.68°C for the year 2017, 33.15°C in 2019 to 35.88°C by the year 2021, showing that, the built-up has increased over time. Whereas, in Crop Land the LST were 30.45°C in 2017, 30.86°C in 2019, and 31.31°C in 2021 suggesting a decrease in cropland over the study years. Similarly, for flooded vegetation, the LST was 27.48°C in the year 2017, 29.61°C in 2019 and 31.68°C in 2021. Likewise, for range land, it was 31.62°C in 2017, 32.25°C in 2019 and 33.57°C in 2021. Similarly, LST on vegetation was 24.48°C in 2017, 31.55°C in 2019, and 31.68°C in 2021. On water, the LST were 22.44°C in 2017, 22.93°C in 2019, and 23.85°C in 2021.

Table 4 Zonal statistics result of the Land use/Land cover and LST

Class Name	Mean LST (2017)	Mean LST (2019)	Mean LST (2021)
Bare land	30.21	35.23	35.35
Built-Up	31.68	32.15	32.88
Crop Land	32.45	32.86	33.31
Flooded Vegetation	27.48	29.61	33.68
Rangeland	32.62	33.95	34.57
Vegetation	24.48	31.55	31.68
Water	22.44	22.93	23.85
Source; computedusing	Arc Map 10.4		

VI Vs LST

The correlation analysis was presented in (Figure 6). In 2017, the correlation between NDVI and LST was found to be strongly negative with a coefficient value of r= -0.772 and R^2 = 0.597. This means that as the NDVI increased,the LST decreased significantly.

In 2019, the correlation between NDVI and LST was found to be moderately negative with a coefficient value of r=

-0.534 and R^2 = 0.285. The negative correlation is still present and stronger than in 2021, but weaker than 2017. With a coefficient value of r= -0.273 and an R^2 = 0.075 in 2021, it was discovered that the relation between NDVIand LST was just weakly negative. Although the negative relationship still exists, it is smaller compared to 2017 and2019.

Elevation Vs LST

Using the person r in (Figure 7), a relationship between elevation and LST was calculated. The correlation coefficient (r), whose values range from -1 to 1, indicates the degree and direction of the correlation between two variables. When two variables are negatively correlated, one variable rises while the other falls. The r values in this scenario are all negative and show a reverse correlation between elevation and LST for the years 2017, 2019, and 2021.

The share of variance in the dependent variable (LST) that is explained by the independent variable elevation is shown by the coefficient of determination or R^2. Higher values suggest a stronger association between the two variables.

R^2 values always lie between 0 to 1, a value which close to 1 implies a stronger correlation.

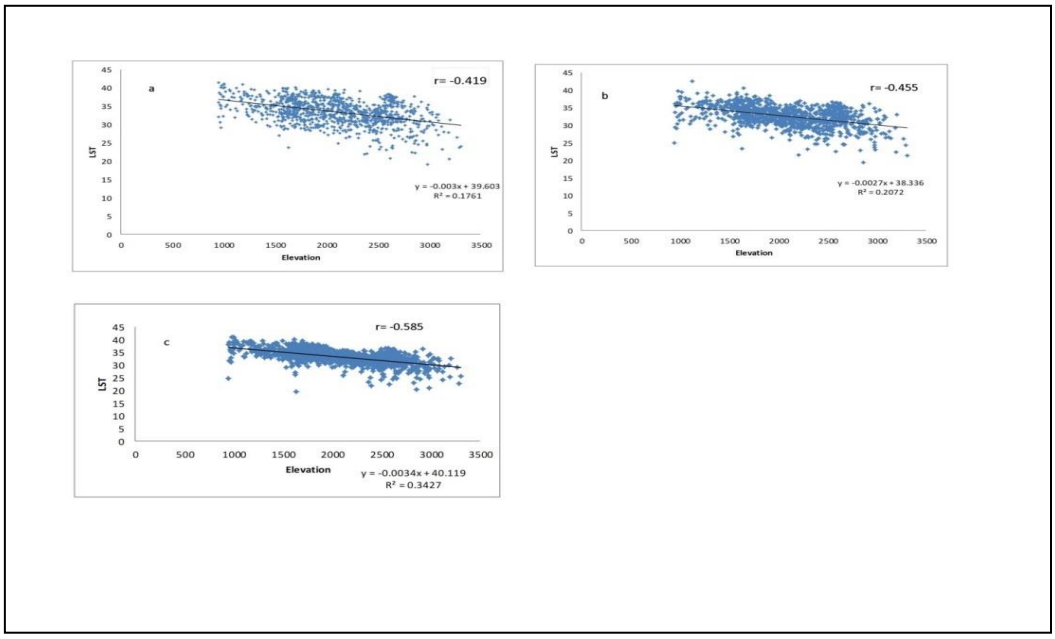
During the year 2017, the correlation coefficient (r) between elevation and LST was -0.412. R^2 (the coefficient of determination) is 0.176 which shows that variations in elevation may account for approximately 18% of the variancein LST. This implies that while elevational variations could have some effect on temperatures in 2017, LST might also be altered by other causes.

The relationship between elevation and LST in 2019 is significantly more concerning than it was in 2017, according to r, which is -0.455 and R^2 (the coefficient of determination) = 0.207, elevational variations account for around 21% of the variance in LST. This suggests that, as compared to 2017, the influence of elevation on temperatures may have risen slightly in 2019. The correlation coefficient (r) for 2021 is -0.585, which indicates a more pronounced negative link

between elevation and LST than it did for 2017 and 2019.

The coefficient of determination (R^2) is 0.342, meaning that variations in elevation account for around 34% of the variance in LST. This suggests that the impact of elevation on temperatures may have increased significantly in2021 compared to both 2017 and 2

Figure 7 Elevation Vs LST



Agro climatic region Vs LST

The mean LST in different Agro climatic region of the study area were estimated in (Table 5). The mean LST in Kola were 34.67°C in the year 2017, 35.63°C in 2019 and 35.99°C in 2021. Whereas, in Woina Dega the observed mean LST were 33.15°C in 2017, 33.73°C in2019 and 34.06°C in 2021. In Dega Agro climatic zone the mean LST were, 31.35°C in 2017, and 31.38°C in 2109 and 31.81°C in 2021. In the Wurch zone the LST were 26.76°C in the year 2017, 27.14°C in 2019 and 27.75°C in 2021.

Table 5 Zonal Statistics results from the agro-climatic region and LST Agro climatic region Mean LST (2

		Mean LST 2019	Mean LST 2021
Kola	34.67	35.63	35.99
Woina Dega	33.15	33.73	34.06
Dega	31.35	31.38	31.81
Wurch	26.76	27.14	27.75

Discussions

Land use land covers classification, NDVI, Agro-climatic region, LST Retrieval, and Statistical analysis.

Land use land cover classification

The Land use land cover had experienced a bit changed throughout 5 years of study period. The built up and followed by ranging land experienced an increased for the expenses of Vegetation and cropland. Both vegetation and crop land decline dramatically for the last 5 years. Several previous studies conducted in Addis Ababa confirm this results (Moisa and Gemeda 2021; Bekele et al. 2022; Balew and Semaw 2022). Similarly, Water body, bare land and flooded vegetation had shown to be a slightly decreased respectively.

NDVI

The highest NDVI value through the study period was decreased; similarly, the low NDVI value becomes decreased Figure 3. This result consists with the study in which were conducted by (Moussa Kourouma et al. 2021) in Ethiopia. Negative NDVI values signify a low plant cover, a lack of vegetation, a lack of human-made land use, or both in the target region. Both the minimum and maximum NDVI values were decreased noticeably, this could be due the declinations of vegetation from 2017 to 2021 (Table 2 and Figure 2) (Muralitharan et al. 2022).

The huge disparity between the highest and minimum NDVI values shows that the plant cover and land use have changed significantly over the study period. The NDVI values may have gradually changed over time because of natural occurrences or human actions like urbanization, deforestation, or climate change (Muralitharan et al. 2022). the research's that has been conducted elsewhere assures this result (Muralitharan et al. 2021; Worku, Teferi, and Bantider 2021).

Agro climatic zone

Table 3 shows the study area agro climatic zone which lies between Wurch to Kola (Dixon 2003). The Woina Dega shares the maximum area 2232203 hectare followed by Dega 1614262.5 hectare from the total area of the study area. In other way the minimum area goes to wurch 12038.52 hectare followed by Kola 477861.24 hectare.

LST Retrieval

The result in (Figure 5) revealed that the minimum and maximum LST values were recorded during the study period, and there were an increased temperature patterns in different parts of the area. These maximum temperatures were observed in the peripheral parts of the study area compared to other parts. The high maximum temperature from the study period were observed in 2021 this could be due to the urbanization processes that occurred during that period, leading to land-use changes, which increased the heat island effect in the area. By analyzing the findings of earlier investigations, similar LST patterns have been discovered in the study region (Bekele et al. 2022).

The lowest minimum temperature was observed in central western parts of the study area

throughout the study time. This result was supported by (Abera 2021; Balew and Semaw 2022; Degefu et al. 2023) who conduct researchin Addis Ababa.***tistical Analysis***

LULC vs. LST

The statistical data for the seven main land cover classifications are shown in (Table 4). The findings demonstrate that the built up had the highest mean LST during the span of the study. The second-highest mean LST was foundon bare land, which was compared to crop land, vegetation, flooded vegetation, range land, and water the pervious study conducted in the study are confirms this result (Bekele et al. 2022). Rangeland had the third highest mean LST followed by Crop Land, Flooded Vegetation, Vegetation and water respectively.

NDVI vs. LST

The statistical findings are shown in (Figure 6) for this study's investigation of the NDVI-LST relationships using linear regression analysis. The findings demonstrated that during the study's years, NDVI and LST often exhibit a negative linear relationship. This means that the surface temperature will be lower and vice versa when the plant cover increases. The outcomes of earlier investigations did here and abroad provide support for these results(Arsiso, Tsidu, and Abegaz 2023; Degefu et al. 2023; Mekonen and Berlie 2020; Pal and Ziaul 2017; Zhang,Odeh, and Han 2009).

Elevation Vs LST

In 2017, there was a severe inverse association between Elevation and LST. The coefficient of determination (R^2) indicates that variations in elevation can account for approximately 18% of the variance in LST. This implies that while elevational variations could have some effect on temperatures in 2017, LST might also be altered by other causes.

The association between elevation and LST is much stronger in 2019 than it was in 2017, according to thecorrelation coefficient (r). According to the coefficient of determination (R^2), variations in elevation account for around 21% of the variance in LST. This suggests that, as compared to 2017, the influence of elevation on temperatures may have risen slightly in 2019.The correlation coefficient (r) for 2021 shows a decrease from 2017 and 2019.

This suggests that, as compared to 2017, the influence of elevation on temperatures may have risen slightly in 2019.The correlation coefficient (r) for 2021 indicates a more pronounced negative link between elevation and LST in compared to 2017 and 2019.

The coefficient of determination (R^2) shows that variations in elevation may account for around 34% of the variance in LST. This shows that, relative to both 2017 and 2019, the effect of elevation on temperatures may have greatly risen in 2021.

Agro climatic region Vs. LST

Table 5 estimates the mean LST for each agro climatic zone in the research area. The mean LST in different agro climatic region has been increased spatially and temporally. As the result portray in (Table 5), the highest mean LSThad been observed in Kola, followed by Woina Dega, Dega and Wurch Respectively throughout the study timeline.

Conclusion

This study was mainly focused on Evaluations of land surface temperature in case of Addis

Ababa and its neighboring, Ethiopia. The study's findings showed that between 2017 and 2021, there were significant changes in land use and land cover, normalized difference vegetation index (NDVI), and land surface temperature (LST).

Cropland was the most prevalent kind of land cover over the research period, almost all it is making up roughly 66%of the total area in each of the three years. According to the analysis of land use and land cover, built up had shown to be the most increasing trend for the expenses of vegetation and crop land. The distribution of other land cover types, like bare land, flooded vegetation and water stayed largely constant over time.

The NDVI investigation showed that from 2017 to 2021, the highest values, which indicate vegetation cover, gradually fell. Similarly, the minimum NDVI values showed a lack of vegetation or man-made land use.

According to the agro climatic zone analysis the research area primarily laid under the Woina dega and Dega zones, with the former taking up the most space.

Based on the LST analysis, Higher maximum temperatures were reported in periphery locations, which showed variable temperature patterns throughout the research area. Over time, the minimum temperatures stayed largely constant.

According to the research key findings, there are noticeable differences in land surface temperature (LST)between various land cover classes, and agro climatic zones. Generally, the mean LST across different Land use / land cover classes shown to be increased. But the highest mean LST was observed in the built up followed by bare land. Contrarily the minimum mean LST was seen in water land use/land cover class. The mean LST in different agro climatic zone were significantly increased. The highest mean LST was recorded in Kola followed by Woina Dega, Dega and Wurch respectively. Finally, there were variances in the mean LST values among the various agro climatic areas. Kola and Woina Dega had greater LST values than Dega and Wurch zones, showing that the temperatures were distributed differently in each area.

The correlation coefficients were used to examine the relation between the normalized difference vegetation index (NDVI) and LST, elevation and LST. The NDVI and LST correlation was found in 2017, showing that as NDVI rose, LST sharply declined. The weakening of this negative association in 2019 and 2021, however, points to a gradual waning of the relationship between NDVI and LST. Whereas elevation and LST correlation results showed that LST was negatively correlated with elevation for each of the three years. When compared to 2017, elevation changes accounted for about 34% of the variation in LST in 2021. This suggests that elevation's influence on temperatures will continue to grow over time.

In general, these data shed light on the dynamics of land use/ land cover, NDVI (vegetation), agro climate region, and land surface temperature patterns in the research area. In addition, this study illustrates the variability in LST across various land cover classes, agro climatic areas, throughout the study years. It sheds light on how elevation, vegetation indices, and land cover changes affect temperature patterns. The study emphasizes how crucial it is to monitor and comprehend these variables to effectively manage the land, plan it, and promote sustainable development in the study area and other nearby locations. By investigating the underlying reasons and implications of these observed alterations, future studies can build on these findings. These results can help with well-informed planning and decision-making for land use management and climate change adaptation measures.

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4.4. Green Taxation as an emerging financial tool for Environmental protection: An appraisal of its legality and feasibility under the Ethiopian legal frameworks

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Abstract

Environmental challenges are unprecedentedly increasing the pressure on the world communities to find ways to reduce environmental damage while minimizing harm to economic growth. In this context, environmental tax is a novel idea to enforce or introduce taxes on substances, that will pollute the environment, the aim being the substantial reduction of pollution. African countries like Zimbabwe and the Republic of South Africa have taken various initiatives toward the implementation of green taxes. Coming to the Ethiopian context, Environmental protection is at a crossroads. Even, the low environmental standards or race to the bottom under bilateral investment treaties of Ethiopia has added an insult to injury. Accordingly, the objective of this study is to examine the legality and feasibility of green taxes under the Ethiopian legal framework. In doing so, the research has employed doctrinal legal research methodology. *The finding of the study shows that though the FDRE Constitution, Environmental policy, and other subsidiary laws on the Environment have provided various mechanisms, responsibilities, and duties of concerned stakeholders, green taxes, which is an emerging tool for environmental protection are nowhere mentioned under the Ethiopian tax system. Further, the study unveils that green tax is feasible as the existing legal framework and environmental policy are in favor of ensuring environmental protection, which is the goal of green taxation. Accordingly, it is recommendable for Ethiopia to introduce green taxation schemes if it is aspiring to realize sustainable development.*

Keywords: *Green tax, Environment, polluter pays principle*

Introduction

The transition to a post-carbon economy is still in its early phases. According to the United Nations' Intergovernmental Panel on Climate Change, the increase in global carbon emissions caused by human activity will have "severe, ubiquitous, and irreversible implications for people and ecosystems" (Christopher B. Field, Vicente R. Barros and Michael D. Mastrandrea etl ,2014). To combat climate change, policy choices in developing countries—where total emissions currently exceed those in developed countries—are crucial. Recent developments are encouraging international leaders in politics, policy, and industry are becoming more aware of the gravity of the threat posed by climate change and the advantages of taking preventative action (Miria A. Pigato and Simon Black,2019).

Well-designed fiscal policies can mitigate climate change while raising welfare (Miria A. Pigato and Simon Black,2019). Fiscal instruments are among the most effective means to fight climate change while raising human welfare. one of the novel fiscal instruments currently introduced to ensure the protection of the Environment is green taxation. There is no single 'correct' definition of what should and should not be included in any account of green taxes. To this paper, A green tax is a tax imposed on pollutants in the surroundings or on products that contribute to pollution through frequent use (Prakashatia, Kanishka Gupta,2020). Green taxes (also referred "environmental taxes", "pollution taxes" or "eco-taxes") are the excise taxes on environmental

contamination or on products that generate this emission (Prakashatia, Kanishka Gupta,2020). It is often felt that green tax reduces environmental harm slightest degree luxurious manner by promoting behavioral changes by way of businesses, corporations, communities and households and individuals, and so forth ((Prakashatia, Kanishka Gupta,2020).

Although the idea of green tax grew very nearly a century back, its dynamic exchange in the scholarly world began about 50 years prior. In the mid-1970s, financial analysts, David Montgomery (Montgomery, W. D,1972) and William Nordhaus (Nordhaus, W. D ,1977) began to investigate carbon tax and other carbon estimating instruments like the cab and trade scheme. Green taxation is used mainly to discourage negative impact on the environment which occurs from the activities of businesses (Nordhaus, W. D ,1977). Due to the dangers of global warming, corporations, governments, and consumers among other stakeholders are becoming aware of the impact of business activities on the environment (Nordhaus, W. D ,1977). Numerous environmental groups have been established to pressurize all stakeholders to act sustainably. Since the 1990s, green taxation has been applied to changing the burden of taxation from growth-oriented factors to help in reducing the depletion of natural resources and pollution (Andreoni. V,2019).

Green taxes have many important advantages, such as environmental effectiveness, economic efficiency, the ability to raise public revenue, and transparency (OECD, 2011). Further, green taxes have been successfully used to address a wide range of issues including waste disposal, water pollution, and air emissions (OECD, 2011). Numerous studies have demonstrated that green taxation is the most effective way to assure environmental protection, whether it be through the imposition of taxes on ecologically harmful products or the provision of incentives for environmentally friendly ones.

Environmental concerns were absent during UN discussions on the Universal Declaration of Human Rights and the negotiation of the two international human rights covenants, for the simple reason that the instruments were negotiated before the advent of the modern environmental movement in the late 1960s (David Boyd, John Knox, &Marc Limon). The first significant effort to change this *status quo* came almost 50 years ago when States adopted the 1972 Stockholm Declaration and Action Plan for the Human Environment (David Boyd, John Knox, &Marc Limon). The Stockholm Declaration catalyzed a global movement to better connect human rights and environmental concerns in national legislation and even in national constitutions. Increasingly, that included moves by governments to recognize, at the domestic level and in regional treaties, the inalienable right of their people to a safe, clean, healthy, and sustainable environment (David Boyd, John Knox, &Marc Limon).

Coming to the context of Ethiopia, environmental protection is at a crossroads. Reports show that the lax regulations and race to the bottom under bilateral investment treaties are the main factors that make the issues of environmental protection cumbersome. The FDRE constitution has vividly incorporated the issues of environmental protection and sustainable development. Though the FDRE constitution and other subsidiary laws recognize the right to live in a clean and healthy environment and the obligation of states to ensure the protection of the environment, its implementation is at a crossroads. Hence, there is a need to revisit the environmental issues and explore an opportunity for the proper protection of the environment through green taxation as it has proved to be a novel idea to ensure sustainable development. Accordingly, green taxation plays a pivotal role in the protection of the Environment

Statements of the problems

Environmental protection is the foundation of everything. This is attributed to its multidimensional advantages in the day-to-day activities of human beings. Any country that wants to ensure sustainable growth should ensure the protection of the environment as it is the main pillar of sustainable development. Yet, currently due to man-made and other reasons Environmental pollution is unprecedentedly increased. In response to this, the world communities are grappling with the issues as to how environmental protection may be ensured or at least reduced so that the communities will share from its chalices. A variety of initiatives were made in this direction. One of the novel ideas currently introduced to ensure the protection of the Environment is green taxation. Green taxation is one of the unique ideas now being put out to promote environmental conservation. Numerous studies have demonstrated that green taxation is the most effective way to assure environmental protection, whether it be through the imposition of taxes on ecologically harmful products or the provision of incentives for environmentally friendly ones.

In the context of Ethiopia, environmental protection is at a crossroads. Reports show that the lax regulations and race to the bottom under bilateral investment treaties are the main factors that make the issues of environmental protection cumbersome. The FDRE constitution has vividly incorporated the issues of environmental protection and sustainable development. Yet, Ethiopian investment law did not effectively integrate such concerns. There is neither express reference to the constitution nor a detailed provision that fully integrates this constitutional requirement under the investment legislation. Not only this, but nothing is also provided under the preamble and objective of the Ethiopian investment proclamation and regulation.

Furthermore, BTI country reports of Ethiopia (2016) state that in Ethiopia, environmental law is weak and not strongly enforced (BTI, 2016). The report says the environmental issue is not given proper attention, and they are overridden by development or growth efforts. The report, in other words, states that Ethiopian development is not sustainable. This seems to imply that the state is currently interested in economic growth and does not want to scare away FDI on pollution and environmental protection. What makes things worse is that nothing has changed even in 2018. Ethiopia's BTI country report (2018) provides that Environmental impact assessments are not seriously undertaken for almost all major development projects, whether it is hydropower generation or mechanized agriculture (BTI, 2018). In sum, environmental concerns are rarely considered in determining developmental programs and policies.

Besides, Ethiopia is about to liberalize some previously government-dominated sectors, which has the potential to boost foreign direct investment. Various industrial parks were also established in different parts of the countries, and all this has put the issues of Environmental protection at a crossroads. To ensure environmental protection, there is a need to be concerned and look for cutting-edge solutions like green taxes. Accordingly, the issues of the legality and feasibility of green taxation as an instrument for the protection of the environment under the existing legal and institutional framework need research. Even, to the extent of my knowledge and access, I was unable to locate any research that had been done on the legality and feasibility of green taxation in Ethiopia. Filling in the gaps in the literature is therefore necessary.

Objectives of the study

General objective of the study

The general objective of the study is to examine the legality and feasibility of green taxation as a tool for environmental protection under the Ethiopian legal frameworks.

Specific objectives

To achieve the general objective at hand, the research has the following specific objectives:

✓ *To examine the legality of green taxation under Ethiopia under the Ethiopian tax regime.*

✓ *To assess the feasibility of green taxation for the protection of the Environment under the current Ethiopian reality.*

✓ *To assess the possible challenges and prospects of introducing green taxation.*

✓ *To assess whether the existing institutional and legal framework is suitable for the implementation of green taxation or otherwise.*

Research Questions

The research has answered the following research questions:

1. *Does Ethiopian law support the imposition of green taxes for environmental protection?*
2. *Is it feasible to impose green taxes for the protection of the Environment in the current Ethiopian reality?*
3. *What are the potential difficulties and opportunities of implementing green taxation under Ethiopian law?*
4. *Is the current institutional and legal framework in place suitable for the implementation of green taxes?*

Methodology

Like other disciplines, legal research has its Methodology. The prominent Methodology for conducting legal research is doctrinal and non-doctrinal legal research Methodology. Doctrinal legal research Methodology is research into legal doctrines (rules, principles, etc.) and it involves analysis of statutory provisions and cases by applying the power of reasoning. On the other hand, non-doctrinal legal research Methodology is used to address the relationship between law and other behavioral sciences, and it emphasizes the relationship of law with people, social values, and social institutions. Coming back to the issue at hand, the research has employed doctrinal legal research Methodology and operationalized it via desktop research. This Methodology is selected as the objective of the paper is to examine the legality and feasibility of green taxation as a tool for the protection of the Environment under the Ethiopian legal framework.

Doctrinal legal research Methodology is used to make legal analyses and provide an in-depth understanding of the matter, thereby deepening the knowledge of the subject under study. To this end, the research has used both Primary and secondary data sources to make a qualified analysis. Accordingly, domestic laws like the FDRE constitution, Environmental pollution control proclamation, related tax laws, and international human rights ratified by Ethiopia are the primary sources while Books, articles, journals, reports, unpublished materials, and internet sources are the secondary sources.

Thus, doctrinal legal research Methodology has been employed to investigate the pertinent provisions of the laws. As far as design is concerned, the research is inherently descriptive to critically analyze the pertinent provision of the FDRE constitution, Environmental pollution control proclamation, related tax laws, and international human rights instrument ratified by Ethiopia. Again, it is critical/ normative as it offers concrete lines for reforming the laws. Finally, thematic analysis was used as a method of data analysis as it is the common method for data analysis in legal research.

Results and Discussions

Environmental Protection Under Ethiopian Legal Framework

To address the global environmental challenges, numerous attempts have been undertaken since the eighteenth century to establish international environmental law tools. The initial endeavors, however, were concentrated on protecting wildlife (Desalegn Amsalu,2018). Environmental rights, notably the right to a healthy environment, were not officially acknowledged in an international environmental treaty until the United Nations Conference on the Human Environment in Stockholm on June 1972 (Desalegn Amsalu,2018). In terms of both conference organization and results, the Stockholm Conference was the most successful international conference at the time (L Sohn,1973). The United Nations Conference on Environment and Development (UNCED), also known as the Rio Conference, was held in Rio de Janeiro, Brazil, on June 14, 1992, 20 years after the Stockholm Declaration. Several regional and national advancements in the recognition of environmental rights as human rights were sparked by the Stockholm and Rio Declarations. As a result of this development, numerous national constitutions and legislation have acknowledged the right to a healthy environment because of the government's obligations to accept the values embodied in the two declarations ((Stockholm Declaration, 1972" & Rio Declaration on Environment and Development, 1992").

Most African nations now include environmental rights for their inhabitants in their Constitutions or other important legal documents because of advancements in international environmental rights law. Environmental rights found in the main international environmental law conventions are also incorporated into Ethiopia's 1995 Federal Constitution, its environmental policy, and all subsequent laws (Desalegn Amsalu,2018).

Depending on the jurisdiction, different laws may have different definitions of what environmental rights entail (Desalegn Amsalu,2018). The right to information, the right to public participation in environmental issues, the right to a clean, healthy environment (also known as the right to a quality environment), and the right to access environmental justice make up the minimum set of rights that are shared by common law and civil law legal systems (D. Shelton and A. Kiss,2005). The first right is the right to a clean and healthy environment. This right is vehemently recognized under the FDRE constitution. Accordingly, the Ethiopian Constitution provides that "All persons have the right to live in a clean and healthy environment" (The 1995 Environment Policy, Article 2(3)(a)). Further, the environmental policy of our country has also provided for the right of every person to live in a clean and healthy environment (The 1995 Environment Policy, Article 2(3)(a)). The new labor law proclamation (Labour Proclamation No.1156/2019) and the civil servant's law proclamations (Federal Civil Servants Proclamation, Proclamation NO.1064/2017) of Ethiopia have also included this principle concerning the working conditions of workers/employees.

The other right that falls within the scope of the environmental right is the right to information. The idea that citizens should have the right to information about the environment is also another established right at a broader level (Desalegn Amsalu,2018). The FDRE Constitution recognizes the right of citizens to information in general, which should also include the right to information about the environment (FDRE Constitution, Article 29(2)). Not only this, other subsidiary laws like the Environmental Pollution Control Proclamation (Environmental Pollution Control Proclamation No.300, 2002) and its council of minister regulation have recognized the right to information about the Environment.

The third one, which is access to justice, is also an important component of environmental rights. This right is provided by the FDRE constitution. Accordingly, article 37 of the FDRE constitution

provides that "everyone" has the right to bring to court any justiciable matter (FDRE Constitution, Article 37(1)). This provision is not specific to the environment, but it is indicative of the fact that "any person" can bring any justifiable matter to court. Additionally, special measures governing environmental rights are included in environmental laws. According to Ethiopia's Environmental Pollution Control Proclamation, "everyone" has the right to environmental standing without necessarily asserting a vested interest (Environmental Pollution Control Proclamation No.300,2002). This is again reaffirmed by the Council of Ministers' regulation on the Prevention of Industrial Pollution (Desalegn Amsalu,2018). Besides, the new federal court's proclamation has recognized public interest litigation, to which environmental issue is not an exception (Federal Courts Proclamation, Proclamation No.1234/202).

Finally, the right to public participation is another right within the ambits of Environmental rights. Citizens have a right to environmental information as well as the ability to participate in environmental decision-making (Desalegn Amsalu,2018). This right is provided under the FDRE constitution in general, which also should include participation in environmental issues (FDRE Constitution, Article 43(4), 89(6), and (7)). The country's Environmental policy and environmental impact assessment proclamation have reaffirmed what is provided under the constitution (The 1995 Environment Policy, Article 4(2) and Environmental Impact Assessment Proclamation No.299,2002).

The Place of Green Taxation under the Ethiopian Tax Regimes and the Need for A Workable Legal Framework

As it is mentioned in the other parts of the paper, green taxation has a pivotal role in the protection of the environment which is a foundation for the realization of human rights. Yet, the issue as to whether the current tax regimes of Ethiopia have given the necessary space for green taxation is not clear. The existing tax regimes of Ethiopia have given more attention to raising revenue than the protection of the environment. Green taxation can be implemented either through the reduction or exemption of VAT, Excise tax, and customs duty. The scrutiny of the working Value added tax proclamations (Value Added Tax Proclamation of Ethiopia, Proclamation. No. 285/200 & Value Added Tax Amendment Proclamation No.1157-2019) and regulations (Council of Ministers Regulations No. 791/2002). shows that neither exemption nor reduction of taxes is made on the products or activities that are Environmentally friendly. The transaction of both products or activities that are hazardous to the environment and those that are environmentally friendly were subjected to the same tax rates without any other consideration. In short, no attention is given to the protection of the environment as more emphasis is given to raising revenue for the government.

Again, one of the proper ways by which those products that are hazardous to the environment may be controlled is via the imposition of Excise taxes. If we look at the current excise tax proclamation (The Excise Tax Proclamation No. 1186/2020 and Excise Tax Amendment Proclamation 2020), no sufficient attention is given to the protection of the Environment. Since the primary purpose of the excise tax is to reduce the consumption of products that are hazardous to health, incidentally some products that are hazardous to the Environment were subjected to excise taxes. We can mention products like tobacco. Still, though such products were subjected to taxes, it is not because the Ethiopian government has a plan to protect the Environment. Had the Ethiopian government plans to protect the Environment, those luxurious goods that are hazardous to the environment and those that are Environmentally friendly should not be subjected to the same tax rates. For instance, a car that uses electricity and a car that uses fuel should not be subjected to the same tax rates. Reducing tax rates or even exemption of environmentally

friendly products is the avenue by which green taxation can play its role in the protection of the Environment. Unfortunately, the current excise tax laws of Ethiopia are not designed in a way that allows for the implementation of green taxation.

Another way by which green taxation may be implemented is through customs duty. The scrutiny of the working custom proclamation (Customs Proclamation No. 859/2014) and regulations (Council of Ministers custom Regulation No. 518,2022) shows that no attention is given to the protection of the Environment. Products or activities that are hazardous to the ecosystem and those that are friendly to the environment are treated equally. Those products that are hazardous to the Environment should be subjected to high tax rates while those products that are environmentally friendly should enjoy some incentives or low tax rates. What makes things worse is that environmental treatment technology is subjected to the same tax rates as other products that are hazardous to the Environment.

Above all, green taxation is designed to implement the principles of 'polluter pays". This principle is adopted by Ethiopian Environmental laws (Environmental Protection Organs Establishment Proclamation No. 295/2002). Even, revising the excise tax proclamation, VAT, and custom proclamation is not a sufficient way to ensure the protection of the Environment through green taxation. we need to have clear laws that allow the government to protect the Environment via green taxation. It is the central principle of taxation that if there is no law, there are no taxes. The legality principle of taxation is not only "no taxation without legislation" but it also forbids judges from applying the black letter of a taxing act to situations where it is not clearly implied by the wording of the law, favoring a literal reading of tax laws (FransVanistendael,1996) That entails a restrictive interpretation standard under which judges must always interpret tax laws in the taxpayer's favor, meaning that when in doubt, tax laws must be interpreted in the taxpayer's favor(Bernard Peeters,2007). Hence, unless we reform our tax laws and clearly recognize green taxation, it is quite difficult to implement the polluter pays principles.

Prospects and Feasibility of Green Taxation for the Protection of the Environment

In Ethiopia, both the federal and state government have the duty to enforce and respect the right to live in a clean and healthy environment (FDRE Constitution,1995, arts. 13(1), 92(1–4)). Due to these responsibilities, all city governments in Ethiopia have a duty to introduce a sanitary service provision tax and ensure integrated municipal waste management (Federal Pollution Control Proclamation No. 300/2002, Article 5(1)). They also must provide public goods that the private sector will not, or cannot, provide (National Conservation Strategy Volume II,1994). Simultaneously, city governments shall collect money from their citizens only when authorized by law (Federal Government of Ethiopia Financial Administration Proclamation No. 648/2009, article 17). Despite this, the issues of Environmental protection as it stands now are at a crossroads. The absence of environmental protection would inevitably hamper the realization of human rights, and this will call for the Introduction of green taxation as it is found to be a novel idea to ensure the protection of the Environment. Accordingly, the prospects and the feasibility of green taxation for the protection of the environment will be presented as follows.

Studies have divulged that one of the factors for the non-implementation of Environmental rights in Ethiopia is the lack of proper and up-to-date technology ((Desalegn Amsalu,2018). Environmental protection requires the use of up-to-date technologies, but there is a lack of environmental infrastructure in the case of Ethiopia (Desalegn Amsalu,2018). As technology can be the cause of environmental problems, so too can it be the solution (Desalegn Amsalu,2018). In line with this, green taxation can be the best solution for such kinds of conundrums just from

two main perspectives. As it is mentioned in other parts of the paper, green taxation is found to be the best option for the protection of the Environment either through imposing taxes on the products or activities that are hazardous to the Environment or through giving incentives or exemptions for the products or activities that are Environmentally friendly. Accordingly, imposing taxes on products or activities that are hazardous to the Environment has two important advantages. one, it will discourage the actors from activities or products that are hazardous to the Environment. On the other hand, it will increase government revenues. Here, the revenues collected from imposing taxes on products or activities that are hazardous to the environment will in turn invested to provide the technological infrastructure that plays a pivotal role in the preservation of the Environment.

Further, green taxation involves giving incentives or exemptions for products or activities that are environmentally friendly. This could be used to import advanced technologies or infrastructure free of taxes. In this way, green taxation would serve a proper role in the preservation of the environment.

Not only this, the finding of the previous research that was conducted on shifting environmental rights from theory to practice in Ethiopia has divulged that the Owners of industries often complain of high charges, including high import taxation which makes it hard for them to acquire pollution-treatment equipment (Desalegn Amsalu,2018). Some factories are even in the habit of threatening to shut down when accused of polluting the environment. The factory owners complain about the high cost of importing treatment technology (Desalegn Amsalu,2018). Green taxation is here to solve such kinds of conundrums as it will allow the industry owners to import treatment technology either at low tax rates or even free of charge. As it is mentioned above, one of the ways by which green taxation could be implemented is by giving an incentive or exemption for those products or activities that are environmentally friendly. Hence, the treatment technology-related factors for the non-implementation of Environmental rights in Ethiopia could be easily solved through the Introduction of green taxation schemes.

In addition, another factor for the non-implementation of Environmental law is the lack of environmental accountability (Desalegn Amsalu,2018). The lack of a sense of accountability is another problem affecting the protection of environmental rights in Ethiopia. For example, if an environmental offense is reported to the EPA, which is rare, the authority will dispatch investigators, and conduct all the required research, but this hardly leads to prosecution. (Desalegn Amsalu,2018). The accountability index in the environmental protection agencies is low; hence there is no commitment in all the vital organs of the agencies to change the situation (Desalegn Amsalu,2018). This can be again resolved by green taxation though green taxation by itself requires the cooperation of various stakeholders like tax authorities and environmental pollution control agencies. If a green tax is put in place those organs that engage themselves in the transaction or production of products that are hazardous to the Environment would inevitably reduce or stop such kinds of undertakings as the mere existence of such laws play its deterrence role.

Further, incentivizing those products that are environmentally friendly and exempting environmental treatment technology would contribute to the preservation of the environment. Imposing taxes on products that are hazardous to the environment would inevitably increase their prices which in turn reduces their consumption. This would greatly contribute to the protection Environment which is a pillar for the realization of human rights. on the other hand, exempting or incentivizing those products or activities that are environmentally friendly would inevitably

reduce their prices which in turn increases their consumption. Consumption of Environmentally friendly products would greatly contribute to the preservation of the Environment.

Finally, the current move of the Ethiopian government toward the green legacy has something to do with changing the attitude of society towards climate change. Previous research has unveiled that the absence of awareness on the parts of society regarding the protection of the environment was found to be a stumbling block for the implementation of the existing legal framework. The current green legacy movement in the country has increased awareness of society towards environmental protection. The Ethiopian government has consistently made global headlines with ambitious tree-planting targets, since launching green legacy initiatives (GLI) in 2019 – which seeks to plant 20 billion trees within four years until 2022(Eyob Getahun,2022). The initiative has also provided a critical chance for the government and its partners to use the media to raise public awareness about the importance of planting trees and protecting existing forests (Eyob Getahun,2022). This will pave the way for the implementation of green taxation which in turn makes the protection of the Environment easy.

Conclusion and Recommendation

Conclusion

Environmental protection is at the heart of all things. by understanding the multi-dimensional benefits of the environment, the world communities have paid proper attention to the protection of the Environment. Various initiatives were made to ensure the protection of the environment as it is the main pillar of sustainable development. Stockholm Conference of 1972 and the Rio Declaration of 1992 are the two main initiatives that put an initial inception for the role of environmental protection in the realization of human rights. prominently, the initiatives ended up with the recognition of the right to live in a clean and healthy environment as a human right.

Various countries including African countries like Morocco and the Republic of South Africa integrated such rights into their constitution. The same is true of the FDRE constitution of Ethiopia. Despite, the initiatives that were taken at the international, regional, and national levels, environmental pollution was unprecedentedly increased. In response to this, green taxation emerged as a novel idea to ensure the protection of the environment either by imposing taxes on products that are hazardous to the environment or giving incentives for products that are environmentally friendly. Environmental protection has a tremendous role in the realization of human rights. In doing so various countries have implemented green taxation as a tool for the protection of the environment which in turn paved the way for the realization of human rights.

Coming to the context of Ethiopia, though the FDRE constitution and other subsidiary laws recognize the right to live in a clean and healthy environment and the obligation of states to ensure the protection of the environment, its implementation is at a crossroads. Even though the FDRE Constitution, Environmental Policy, and other subsidiary laws on the environment have established various mechanisms, obligations, and duties of stakeholders about environmental protection, green taxes, a recently developed tool for environmental protection, are not at all mentioned under the Ethiopian tax system. The study also shows that green taxes are practical because they are ultimately intended to ensure environmental protection, which is supported by both the legal system and the environmental policy currently in place.

Recommendation

Based on the conclusion the following are my recommendation.

- One of the principles of taxation is that no tax can be imposed by the government unless it is provided by the law. Accordingly, since green taxation is proven to be the best avenue to ensure

the protection of the environment, it is recommended for Ethiopia to introduce green taxation through clear laws.

- All concerned stakeholders like tax authorities, Environmental pollution control authority, and Human Rights commission should work in cooperation towards the implementation of green taxation.
- Finally, considering the current inflation, the communities may not graciously welcome such new taxes. Hence, awareness creation should be given to all concerned stakeholders and communities

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4.5. Workplace Noise Pollution Exposure Assessment: The case of selected Office, House, and Household Small and Medium Furniture Manufacturing Enterprises in AA City Administration

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Abstract

This study was conducted under the title of' Workplace Noise Pollution Exposure State of affair ': the case of selected office, House and Household Small and Medium Furniture Manufacturing Enterprises in AA city Administration. The general objectives of the present study were to carry out an assessment on the state of workplace noise pollution exposure level. Under the key general objectives, four *keys specific research questions were framed and addressed. The research was in the design of mixed cross-sectional sequential descriptive research framework. A total of 421survey respondents were involved from two categories of respondents. The study used a survey questionnaire for the quantitative data for surveying opinions, interview guidelines, field reconnaissance noise measurement & observation checklist, secondary data for data collection methods. The data was analysed by using SPSS statistics applying families of descriptive statistics such as measures of central tendency and dispersion statistics. The reliability and validity tests for measures/instruments and methods including measures of skewness and kurtosis were also detected which assured the acceptable limit or coefficient values (.674). The validity(accuracy) of the research design and its methods were also detected for it reflects accurately what intend to be measured through pilot testing, triangulation, and corroboration with multiple sources and interpretations. Practical time-weighted average noise exposure computation was also done, Finally the results from the different methods of statistical analysis revealed that workplace noise pollution exposure is a serious problem and there is a serious violation of the noise standard limit. The action to be taken by the employee and the enterprise owners should be the development of a noise prevention strategy. Future growth scenarios and land use development of the city should be guided consideration to the city planning regulation, proclamation, policy & structural plan in limiting the challenge and the violation.*

Key Words: *Ambient noise, Time-weighted average/TWA/, decibel (dB)*

Introduction

Noise pollution is a growing problem to both developing and developed countries of the world affecting both human and non-human beings in different ways. Noise pollution is one of the most serious environmental problems in major cities of the world, harming both human health and the entire environment. Noise pollution or interchangeably known as sometimes sound pollution is one of the major environmental problems commonly and widely affecting and challenging metropolitan areas and urban centres of the globe. This problem affects also wildlife and other organisms. This problem is mainly associated and emanates due to unnecessary, offensive and excessive disturbing sound emission associated with transport, modernization, urban growth and development and industrialization.

Noise pollution causes adverse health, social, economic and environmental deterioration & impacts. At the present time, noise pollution is considered as one of the key problems of urban

societies that has many dangerous effects on the urban environment that may result a lot of costs on the society (Martin et al., 2006; Chien & Shih, 2007).These problem emanates from different sources from residential areas, commercial, industrial areas and transport sector or street traffic noise. Some international organization like WHO classified noise pollution as indoor and outdoor noise pollution. According to WHO, (2001) the main category of indoor noise pollution includes sources like home appliances, office activities and machines and ventilation appliance including from neighbourhoods.

Like most developing countries of the world, Ethiopia does not have yet a sound regulation and strategies to regulate and manage noise pollution. Given that noise pollution has several serious adverse health, social, economic and environmental impacts, the issues and the problem has not yet gotten adequate attention and recognition on its management. Some of the problems resulting from noise pollution among others includes, hearing impairments, cardiovascular problems, mental health problem, sleeping disturbance, unhealthy, low or not decent and unsafe workplace environment that affect implicitly the economy such as low tourist visitor's flow.

Statement of the Problem

Nose pollution is an inevitable and intangible or invisible environmental problem which is more prevalent in urban setting where there are several human and economic activities. Workplace noise has been a persistent threat since the birth of industries and economic activities. The prevalence of high level of workplace noise pollution has remained a common problem across many urban regions of the world.

Globally workplace noise pollution has become a constant threat since the birth of industrialization and urbanization especially in urban settings. Even though noise pollution is a common phenomenon in urban areas, the level, magnitude and the prevalence and the distribution of the problem is not same in different places and times. As a result of current spatial expansion, socio - political and economic development of Addis Ababa, being in rapid growth and expansion (due to rapid motorization, commercial &industrial activities) it is resulting in an increasing noise pollution causing in unhealthy environment for people to live in and work.

Some previous studies have identified that noise pollution is one of the major and second environmental compliant next to air pollution registered to environment protection authority office in Addis Ababa. And the problem is much disturbing those areas and places of the city adjoining to streets, hotels bars and commercial areas which is associated to inappropriate land use planning and management practices. Being the capital of Ethiopia and the seat of several international organizations, the city has faced with serious problem of noise pollution. On top of that, the location where these workplace /company are established land use wise is in a nearby distance to busy roadsides. Now a days workplaces such as institutions, companies and industry environments have become susceptible and exposed to high level noise pollution affecting the quality life of workplaces, the health of workers, productivity and their customers.

Some of the causes for the prevalence of such problem is partly associated with the sound from construction activities inside and outside, their main location to busy traffic roads ways that expose them to street traffic sounds (sound from pedestrians, ambulances, cars, etc.). As a result of this, presently in virtual experience workplaces and their employees are constantly exposed to high level disturbing noise pollution problem that needs due attention as it is overlooked which, therefore, needs action, control and recommendations based on the assessment level of the problem. In addition to this, much of the existing work /studies done or available on urban noise has been done in relation to general environmental noise pollution.

Noise pollution in Addis Ababa had reached a limit where it was enough to call for proper attention from all concerned bodies. Still, out of control sound blasting from religious institutions, transport vehicles, industrial plants, construction sites, nightclubs and bars, and music shops, to mention few, are threatening to turn the political capital of the continent Africa into a pandemonium of auditory anguish (Yibeltal, 2014).

The study area, Addis Ababa, is growing and moving at an alarming rate towards industrialization, urbanization and transportation development where it has become major centre of high economic growth. Besides to this, AA is the national capital and the home to the African union and other regional institutions serving long been as centre of various public business activities. As a result of this, like other global urban centres, it has become exposed to noise pollution problem which has not yet got much recognition and attention by most of the society and the relevant local government so far.

The rationale to select and study micro and small manufacturing's enterprises (MSEs) is because the issues of MSEs development are among the fore most priority of socio-economic development given the growing need for employment creation and poverty alleviation (Nugent ,2001). In the study area, Addis Ababa, the economy is dominantly supported by the service sector followed by the industry sector. The present study, therefore, tried to investigate the state of workplace noise pollution and assess the level of exposure on workplace in the study area targeting sample manufacturing companies and industry environment which is overlooked until recently.

Objectives of the Study

In line with the research gap and problem, the general objectives of the present study were to carry out a survey on the state of workplace noise pollution exposure level in selected medium and small manufacturing enterprises environment including the compliance and the measures put in place.

Specific Objectives of the Study

Emanating from the general objectives of the study, the following specific objectives are framed as leading and guiding points:

1.To determine whether workplace noise pollution exposure is a potential problem /risk in the workplaces/ or industry/ plant boundary.

2. To evaluate the overall state of workplace noise exposure level compliance with the permissible legal limit of noise source in the study area boundary based on noise emission regulatory standards/ sound limit described by the national environmental standard.

3. To examine the extent of noise exposure level at the sample workplaces boundary /site of the study area.

4. To evaluate measures set in place/ established to control workplace noise pollution in the companies/industry environment.

Research Questions

In line with the objectives of the study, the following leading research questions are developed to guide the research. These are:

1. Is noise pollution a potential problem/risk at the study sites/workplaces?
2. What is the level of compliance to the legal limit of noise sources in the study area workplaces with the existing sound limit described by the national environmental standard?
3. What legal requirements or measures are there/set in place to make workplace noise assessments?
4. What is the level/extent of workplace noise exposure at the study sites /workplaces of the study area?

Scope of the Study

Noise pollution is a prevalent common problem affecting all parts of the city and the institutions or workplaces indiscriminately. However, the cause, source, the time of occurrence and the magnitude of the proposed issue for investigation is not uniform across the city. In this regard, the study has defined thematic, temporal and geographical scope. Accordingly, thematic wise the study was limited to SME workplace noise pollution assessment with particular emphasis to furniture industrial noise issue, time wise the study was cross-sectional, and the geographical scope was limited to urban setting manufacturing enterprises. In general, the present study did not investigate personal noise exposure.

Significance of the Study

Owing to low recognition and estimate to noise pollution problem, the health, social and the living condition of the people and the liveability and quality of the city environment has been adversely affected and threatened from time to time that has been turning and causing the capital highly vulnerable.

Hence, carrying out empirical studies like the present one at workplaces can contribute a lot in understanding the state of the problem, its risk and to take effective control measures on the problem without further invading and affecting the health of the people and quality life/business of the workplaces. The result from the present study is also expected to benefit and contribute the local government in raising the resident's awareness and to remove or at least reduce pressure (maintaining low noise pollution). Finally, the finding from this study will bring practical policy implications.

Literature Review

The Concept of Noise

The concept of noise in literatures is expressed in several ways by different scholars. But most definition given to the concept have common points that noise is unpleasant, unacceptable and irritating sound that is emitted from different sources.

The perception of noise and sound is often a matter of subjective opinion and varies from individual to individual. Studies indicate that the level of the loudness of sound varies from person to person, consequently, no exactness in the meaning likely occurs. Sound/noise is measured in dB (Decibel). People sometimes understand and interchangeably use sound and noise synonymously as similar concepts. However, according to scientific explanation and understanding, sound and noise have some specific difference in that, sound is something that is objective which can be heard simply without difficulty while noise is the unpleasant and unexpected sound which is subjective which is unbearable to be hearing.

The word noise is derived from the Latin word, nausea, meaning seasickness (zerihun, 2017). Noise means wrong sound in the wrong place at the wrong time (Kiely, 2011). Noise pollution may be defined as unwanted sound which gets damped into the atmosphere without regarding the adverse effects it may have. Noise is an unwanted sound that creates annoyance and interferes in conversation, disturbs sleep and the teaching-learning process, reduces work efficiency, causing stress and challenges the public health. A more precise definition could be noise is audible sound that causes disturbance, impairment or health damage.

Literatures and scholars describe and explained that a sound changes to noise when it is not pleasant, wanted, loud enough and beyond unexpected which has harmful effect for human physiology and psychology. A sound can be unpleasant due to intensity of sound, time of exposure, continuity of sound and its frequency. In general, noise is any sound that humans do not want to

hear. Noise is one of the environmental pollutions that affects the quality of life of particularly of population at urban areas worldwide

According to Patrick, (2016) noise pollution occurs when there is either excessive amount of noise or an unpleasant sound that causes temporary disruption in the natural balance (Patrick, 2016). Industrialization, poor urban planning, social and religious events, transportation, construction activities and household chores are causes of noise pollution. Hearing problems, health issues, sleeping disorders, cardiovascular issues, trouble communicating and unsuitability on wildlife are the effects of noise pollution (Conserve Energy Future, 2018).

Noise pollution and Its Associated Implication In urban settings

Urban noise pollution is one of the problems of the people who live in urban area, and it is one of the causes of health, social and environmental problem. Urban noise levels are a multifaceted mixture of noise that emanates from transportation, factories, commercial advertisement, machines, and people. There are many adverse effects of excessive noise or sudden exposure to noise, such as indiscriminate use of horn by the vehicles and widespread use of loudspeakers in social and religious events. The excessive noise released can cause different health problems that includes deafness, nervous breakdown, mental disorder, high blood pressure, headaches, dizziness, inefficiency and insomnia (Ramandeep, G., Arshdeep, S., Vinod, K., & Parampreet, 2014).

Noise that emanates from transport, industry, and neighbors, is a prominent feature of the urban environment. Noise interferes with complex task performance, modifies social behavior, and causes annoyance. According to some studies done on occupational noise exposure, it suggests an association with hypertension, whereas community studies show only weak relations between noise and cardiovascular disease. According to a study done by Abera (2012) using data from 10 sub-cities' environmental offices-2006 to 2010 public reaction to environmental pollution-comparisons in Addis Ababa city: Public complaints on Air pollution was the major one and the second most important was Noise pollution then followed by Chemicals and hazardous waste release

Sources of Noise Pollution

According to different studies and literature, noise pollution is basically categorized into indoor and outdoor noise. When it comes to the sources of noise pollution, according to the Environmental Pollution Centre (2022) the primary sources of noise pollution include:

- Street traffic and road noise that emanates from transport vehicles, cars, pedestrians
- Industrial activities like fans, generators, compressors and mills
- Public works, construction site sounds and from events involving fireworks, ambulances, advisement campaigns, and music album promotions by using sound magnifying devices
- Constant loud sound from music shops /stores and commercial venues such as bars night clubs and shopping facilities
- Residential area noise that emanates from households and residential area/ such as from television, radio, music plying from stereo or computers washing machines sounds.
- Workplace sounds; often common in open space offices
- Construction sounds like drilling or other heavy machinery in operation
- Airports, with constant elevated sounds from air traffic, i.e. planes taking off or landing are to mention few.
- Institutional area noise that emanates from religious institutions such as mosques, churches

Noise Management Standards in Ethiopia

Noise pollution is governed by the Environmental Pollution Control Proclamation 300/2002 and Federal noise emission standards that are mentioned. Even though, there have been a policy and

laws to address to noise pollution, most have never been implemented properly (Zerihun, S., et al., 2017; Nigussie, Z. 2008).

There is a provision in the constitution of the Federal Democratic Republic of Ethiopia (FDRE) stated under Article 44 that grants every person the right to a clean and healthy environment, an outlook happily shared by the country's environment policy introduced in 1997. Besides, Article 92 recognizes the government will "endeavour to ensure that all Ethiopians live in a clean and healthy environment" and "government and citizens shall have the duty to protect the environment." (https://addisstandard.com/noisy-addis-abeba/)

Unlike some countries of the world such as Japan and the United States of America which have specific legislations on noise, in Ethiopia noise pollution is governed under such laws as the Environment Impact Assessment Proclamation No. 299/2002, which defines a "pollutant" as anything that "directly or indirectly produces toxic substances, diseases, objectionable odor, noise, vibration, heat, or any other phenomenon that is hazardous or potentially hazardous to human health or to other living things*."(Nigussie, Z. 2008).*

In addition to the civil code, which in article 1225 forbids citizens from causing damage or nuisance to their neighbours, the Environmental Pollution Control Proclamation No. 300/2002 prohibits any person from polluting the environment by violating the pertinent standard (Nigussie, Z. 2008). The Federal Environmental Protection Authority (EPA), as a government body with the power to formulate policies, strategies and standards, has specified maximum tolerable noise levels based on the general requirements set by WHO (https://addisstandard.com/noisy-addis-abeba/)

Hence, the EPA has set sound standards limits based on settlement patterns such as 75 decibels (dB) for industrial areas, 65 and 55 dB for commercial zones and for residential districts respectively during daytime, whereas 70, 55, and 45 dB respectively for industrial, commercial and residential areas is the limit during nighttime (https://addisstandard.com/noisy-addis-abeba/)

Although the standards are not county specific and not formulated based on studying the country 's noise, there are specified decibels (dB) for commercial, industrial and residential areas for day and nighttime. The numbers seem higher than some other countries, which shows that Ethiopia tolerates noise (Mintesnot, 2018). Even with the generous standards many places exceed the noise level. A study by Mekonen and Leta (2014), showed that in 20 selected places in Mercato open market, the maximum observed value is 102.6 decibels (with an average range from 61.7 to 83.9 decibels).

Area code	Category of area	Day time Note 1	Nighttime Note 2	Remarks
A	Industrial area	75	70	
B	Commercial area	65	55	
C	Residential	55	45	

Source : Guideline Ambient National Environnent Standards for Ethiopie, 2003

Theoretical Framework of the Study

The Driver, Pressure, State, Impacts & Response (DPSIR) framework as a conceptual framework was used to assess, define, and better understand the cause-and-effect relationships of workplace noise pollution. The driver pressure state impact response framework was formulated/established

time for the first time by Anthony Fried in the 1970's. This conceptual framework generally helps to assess or understand the interaction between people and the environment.
In this regard the driver/or driving force as the first stage was the noise source emanating from the company and industry operations and activities of the machines, then the pressure as second stage refers to the noise emission stage, the third stage is the state , which is noise pollution/contamination , then the impact stage is where noise impact is created on the environment and the health of people and the responses which includes the measures.

Methodology

Research Design

The present study was in the design of descriptive explanatory cross-sectional mixed research design that followed the concurrent nested/ embedded mixed research approach that considered both qualitative and quantitative research approaches. The study carried out cross-sectional design to collect data at a point in time to determine the current situation. Among the mixed method design, the study followed, the concurrent nested design that followed the collection and analysis of quantitative and qualitative data at the same time in parallel within the study

3.***1.2. Methods of Data Collection and Data Source***

The fieldwork was carried out from early November to December 2022. Before selecting the study, area information was collected about the number, location and distribution of small and medium-scale manufacturing enterprises. The methods of data collection that were employed to obtain primary data in the present study include both qualitative and quantitative data collection methods. Accordingly, survey questionnaires, interviews, and extensive field level noise assessment were utilized as primary data collection methods.

The study also prepared semi-structured interviews and undertook interview guides for environment protection experts and officials who are directly working on the issue at different institutional level and believed to have rich information or data. Hence, purposive and convenient sampling was used for selecting the participants for key informant interviews. Besides, a self-administered face-to-face survey questionnaire administration was used to assess the opinion of workers/ employees and their awareness regarding noise exposure and the consequences. Secondary data was also collected from past studies, statistical bulletins, abstracts, government reports and proceedings from relevant bodies and similar scientific works available online.

Along with this, desk reviews, reviewing of official government environment policy documents, proclamations, protocols annual reports and guidelines were also consulted. A survey questionnaire was used to collect quantitative data through a household survey by involving selected sample respondents from the sample frame. The survey covered a total of 421 randomly and purposively selected set of respondents. Data was collected on the general characteristics of the respondents and assess current situation. Practical actual filed level or on-site noise level was also measured and calculated by a using the device to measure sound level. Thus, the sound level also known as a noise Level Meter (SLM) and noise dosimeter are the most common instrument for measuring noise level. The Sound Level Meter has different basic internal electronics components that include microphone and a display. The decibel (dB) is the main unit used to describe / or express the intensity or the loudness of sound. The higher the noise(sound) level, the higher is the decibel and vis-a-vis. As a unit of measurement for describing the relative intensity of noise, the decibels are expressed on a scale ranging from 0-130.

Types of Data

Regarding the types of data that was utilized in the present study both primary and secondary data were employed.

The primary empirical data was generated through both survey questionnaire from sample enterprise workers and community survey. In addition to this, to determine the occupational noise level and the extent of noise exposure detailed measurements of noise was carried out through extensive walk field survey by using noise measurement equipment. Also, key informant interviews were conducted. On the other hand, secondary data was collected from previous recorded studies that comprised noise empirical evidence from documents, government statistical bulletins and reports, proceedings etc. In the present study for the collection of the empirical data i.e. workplace noise exposure level assessment, the sound level meter/SLM/ was used alternatively depending on the types of measurement.

Sample and Sampling Technique

Sample Size Determination

As the study depends on both quantitative and qualitative approaches, both probability and nonprobability sampling techniques were employed accordingly. Among the non-probability sampling method, purposive and convenient sampling method were applied for selecting the firms/enterprises. The primary reason to apply nonprobability sampling technique was to select or identify sample manufacturing companies/industries from the city administration and federal offices for interview and to select highly noise prone industry sample sites/areas.

Accordingly, the sample small and medium manufacturing enterprises that were covered for the present study included those formally established small and medium scale manufacturing furniture enterprises involved in office, household, kitchen and office production that were found in the industrial shed village area of Yeka sub-city, AA. In this regard, from among the different formal establishments and categories of Kotebe area small and medium furniture manufacturing enterprises/SMEs of Yeka sub city shed village sites, a sample of two geographical cluster industry work sites were taken for the study purpose. In addition to this, adjacent neighborhood residential settlements were covered/considered for investigating the issues at community level.

On the other hand, to determine the actual sample size of respondents for the survey, the Krejcie and Morgan (1970) sample size determination formula was used. To determine individual respondents/residents for the survey simple random sampling technique was used. The major unit of analysis of the study were SMEs furniture enterprise used as important unit of analysis.

The sampling frame for the purpose of the noise field level survey questionnaire were, therefore, list of small and medium scale manufacturing enterprises that comprises of members, managers and the production workers. For the selection of nearby residents/community who are found immediately adjacent to or surrounding the enterprises / industries of Yeka sub-city area industry shed all business & residential housing units were considered. Hence, the sampling frame of the respondents were identified from the list of small and medium scale manufacturing industries which were found around Kotebe industry shed area found in two sit/cluster.

In this context, based on Krejcie & Morgan's (1970) table of sample size determination rule of thumb considering/or assuming the upper maximum population size, a sample size of 384 were surveyed from all the selected furniture enterprises shed and nearby residents with a one per cent contingency level which was almost 422 survey respondents. According to official statistical estimation from the federal government some 113,977 people in the city are engaged in manufacturing. Also, according to CSA, (2018/19) report in the study area Yeka sub city there are around 100 small and medium furniture manufacturing enterprises with a total number of workers force size engaged of 1500.Therefore as sampling frame for the selection of the required

sample size for SMEs the official address and list of SMEs in Yeka sub-city worda 09 and 11 was used.

According to these reports there were around 107 SMEs in the kotebe industrial sheds. To the surrounding adjacent residential areas, some 50 respondents were taken conveniently. The simple random sampling technique in the selection of survey respondents was used

Table for Determining Sample Size for a Given Population

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	246
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	351
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	181	1200	291	6000	361
45	40	180	118	400	196	1300	297	7000	364
50	44	190	123	420	201	1400	302	8000	367
55	48	200	127	440	205	1500	306	9000	368
60	52	210	132	460	210	1600	310	10000	373
65	56	220	136	480	214	1700	313	15000	375
70	59	230	140	500	217	1800	317	20000	377
75	63	240	144	550	225	1900	320	30000	379
80	66	250	148	600	234	2000	322	40000	380
85	70	260	152	650	242	2200	327	50000	381
90	73	270	155	700	248	2400	331	75000	382
95	76	270	159	750	256	2600	335	100000	384

Note: "N" is population size
"S" is sample size.

Source: Krejcie & Morgan, 1970

A total of 421 sample respondents were surveyed/took part from two potential categories of respondents (MSE workers and adjacent neighboring residential settlements). # **MSEs N= 675(S=246), THH N 320(S= 175) Total S= 421**.krejcie and Morgan (1970) table of sampling was used for determining the required sample size for the enterprise categories the neighboring settlements.

Probability and non-probability (simple random, convenient and purposive sampling techniques were used for individual sample selection. The unit of analysis was enterprises and neighborhoods the sampling frame for the purpose of the field noise survey and for the survey questionnaire were list of small and medium scale enterprises.

Methods Analysis

To address the objective of the study and analyse the data that were obtained from the Likert type of scale, the study employed descriptive by using the statistical package for social science (SPSS). Among the statistical methods that were employed, some families of descriptive statistics such as percentage, mean, mode (for nominal and ordinal data) and median (for ordinal data) were used. In addition to this, for the data that were obtained/ or collected from key informant interview and documents, Thematic and content analysis were used. Noise exposure computation and measurements on level of noise emission was also done for the surveyed enterprises /industry by using devices to measure the level of noise emission and compliance whether it is exceeding or not the standard of the country.

3.2. Data Quality Control: Reliability, Validity, Skewness Kurtosis issues

The issue of reliability (consistency of the methods &instrument design was checked on the Cronbach alpha test computation coefficient score & inter item correlation statistics. Both were in an intermediate acceptable reliability coefficient score (b/n 0 to 1), i.e.**0.635** & 0.90(0.15 to 0.50 inter item corr) which supports the methods and measures and items can reproduce the same result multiple times consistently.

The validity was ensured by triangulation & cross validation of data, methods, theory and pilot testing on 10 % of survey respondents**,** standardized questionnaire. To check/find the skewness and kurtosis for data spread out /asymmetry and vertical peakness/ flatness, the data distribution was normal (range value -2 to 2 and -7 to7) that implies mean= median=mode)

Results and Discussion

Demographic Characteristics of Respondents

This present study surveyed a total 421 respondents. The study consisted of two categories of respondents, i.e. manufacturing enterprises workers that consist of 306(72.85%) and local community /resident representatives which are 114(27.14).

The demographic characteristic of the study is summarized in the subsequent tables below. The gender summary of the respondent is presented in table 1. Regarding the gender composition of the respondents from the total 421 sample respondents, 209(49.6%) are females and the remaining 212(50.4%) are male respondents which is the almost proportional number of gender representation. The marital status of the respondents; 37.3% (157) of the respondents were married during the survey while 60.6% (255) of the respondents from the respondents were single.

The age of the respondents was the dominant and the age group between 20-30 years less than 20 years being the minimum and 60 above was the maximum age bracket. In summary, 63.9% of the respondents fall between the age of 20-30 years while 12.3% were within the age bracket between 31-60 years followed by 22.3% that represent the respondents who were less than 20 years while 1% were from the age of above 60 years.

Table 1 Socio Demographic Background of the study Respondents

Sex of the respondent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	212	50.4	50.4	50.4
	female	209	49.6	49.6	100.0
	Total	421	100.0	100.0	

Frequency Distribution of survey of respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Industrial workers	246	58.43	58.43	58.43
	residents	175	41.56	41.56	99.5
					100.0
	Total	421	100.0	100.0	

		Frequency	Percent	Valid Percent	Cumulative Percent
Marital status of respondents	unmarried	255	60.6	60.6	60.6
	married	157	37.3	37.3	97.9
	widowed	3	.7	.7	98.6
	divorced	4	1.0	1.0	99.5
	5.00	2	.5	.5	100.0
	Total	421	100.0	100.0	

		Frequency	Percent	Valid Percent	Cumulative Percent
Respondents Age	<20	94	22.3	22.3	22.3
	20-30	269	63.9	63.9	86.2
	31-60	54	12.8	12.8	99.0
	>60	4	1.0	1.0	100.0
	Total	421	100.0	100.0	

Source Field survey2022/23

		Frequency	Percent	Valid Percent
	illiterate	29	6.9	6.9
	Read and write	17	4.0	4.0
	Primary school	116	27.6	27.6
	Secondary school	156	37.1	37.1
	college/university	102	24.2	24.2
	Total	421	100.0	100.0

As it appears in Table 4.2 education level of the respondent, 37.1% (154) were secondary education level, college education holders were 24.2%, read and write 4.0 % (17) while 6.9% (29) were illiterate and left schools at the time of the survey

Table 4.3: Insight of Respondents on Prevalence of Residential- Industrial area noise exposure conflict & threats

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	11	2.6	2.6	2.6
	disagree	349	82.9	82.9	85.5
	neither agree nor disagree	19	4.5	4.5	90.0
	agree	38	9.0	9.0	99.0
	strongly agree	4	1.0	1.0	100.0
	Total	421	100.0	100.0	

Source: Field survey,2022/23

The table above reveals the insight of surveyed participants on the existence of residential-industrial noise exposure threats and conflicts. In this regard from the total 421 surveyed respondents' the overwhelming majority 349(82.5%) knowingly or unknowingly declared or asserted disagreement on the presence noise driven conflicts and threats. On the other hand, if either the problem is overlooked or misunderstood due to low awareness, the parallel indirect field observation using a walkthrough survey indicated the opposite situation where noise pollution threats arising from the enterprise's daily operation is not an uncommon problem. Also, the different interview sessions conducted with resourceful key informants like responsible experts working at sub-city and district/woreda levels had experience and reports of noise-driven conflict, complaints and had got involved with noise-related conflicts whenever it arose with an appeal from noise pollution receiver victims who are residing close to night clubs, bars and music shops.

Table 4: Respondents Acquaintance of awareness on Common Effects of Noise pollution/

		Frequency	Percent	Valid Percent	Cumulative Percent
	strongly disagree	11	2.6	2.6	2.6
	disagree	202	48.0	48.0	50.6
	neither agree nor disagree	1	.2	.2	50.8
	agree	199	47.3	47.3	98.1
	strongly 4 agree	8	1.9	1.9	100.0
	Total	421	100.0	100.0	

Source: Field survey,2022/23

Table above presents the overall opinion of respondents collected from study participants regarding the possession of relevant awareness on the adverse effect of noise pollution. Accordingly, nearly half 202(48.0%) expressed their disagreement on the possession of significant awareness about the issue. On the other hand, almost equally a significant proportion 199(47.3%) expressed their agreement on the acquisition of relevant awareness about the effect of noise pollution.

The survey results presented in Table 8 show the perceived view and insight of the survey respondents' awareness on the effects of noise pollution. Accordingly, nearly half of the survey respondents 202(48.0%) expressed their disagreement on their level of awareness on the common adverse effects to exposure to noise pollution.

On the other hand, 199 (47.3%) expressed their agreement on they have sufficient awareness on the common effects of noise pollution on human health and the environment. The result from the different side-line interviews on common effects of noise pollution showed that most of the interviewees did not have the awareness while few of the interviewees mentioned they knew the common effects of noise pollution by mentioning even the forms such as annoyance, sleep disturbance, stress, hunger as well as difficulty of focus that affects work performance. In a study done by Mithanga (2013), most of the employees indicated that high occupational noise levels in the manufacturing industries affect work performance and communication among them.

Table 5: Opinion of Respondents on Presence of Extreme Noise Generating Machines

		Frequency	Percent	Valid Percent	Cumulative Percent
	strongly disagree	21	5.0	5.0	5.0
	disagree	132	31.4	31.4	36.3
	neither agree nor disagree	7	1.7	1.7	38.0
	agree	254	60.3	60.3	98.3
	strongly agree	7	1.7	1.7	100.0
	Total	421	100.0	100.0	

Source Field survey2022/23

The table above presents respondents opinion regarding the presence of extreme noise generating machines and equipment. Accordingly, most of the respondents 254(60.3%) confirmed their

agreement on the presence of high noise generating machines and equipment. On the other hand, a significant proportion 132(31.4%) of the respondents of the study replied disagreed with the existence of disturbing extreme noise-generating machines.

Table 6: Enterprises Attention to Control noise pollution problems

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	23	5.5	5.5	5.5
	disagree	297	70.5	70.5	76.0
	neither agree nor disagree	19	4.5	4.5	80.5
	agree	75	17.8	17.8	98.3
	strongly agree	7	1.7	1.7	100.0
	Total	421	100.0	100.0	

Source: Field survey 2022/23

The table above presents the view or opinions of respondents on the amount of attention or emphasis given to noise pollution related problem by the manufacturing enterprises owners. Regarding this, out of the total 421 surveyed respondents of the study, the overwhelming majority 297(70.5%) declared disagree which imply the low attention and emphasis provided to the problem. During the field walk through field observation and interview secession it was also confirmed with evidence that the efforts to improve the situation in the area and the affected community and the workers is low. Besides to this, the different interview secession reports ascertained also that the local sub-city and the owners did not pay as such due attention and follow up to the issue under investigation.

Table 7. Perceived view on Practices of Noise Management and Control in Enterprises

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	25	5.9	5.9	5.9
	disagree	322	76.5	76.5	82.4
	neither agree nor disagree	24	5.7	5.7	88.1
	agree	47	11.2	11.2	99.3
	strongly agree	3	.7	.7	100.0
	Total	421	100.0	100.0	

Source Field survey2022/23

In the above table, the result regarding the enterprises practice in the monitoring and management of noise is presented. Regarding this based on the opinion of the respondents from the total 421 surveyed participants of the survey the overwhelming majority 322(76.5%) replied disagree which imply the absence of practical noise pollution or level monitoring and management practice by the enterprises to assess and improve the problem of noise pollution. Besides to this, most of the parallel interview secessions held with different key informants and actual field level assessment revealed without difference the same kind of result.

The desk review results, and the interviews made with FEPA and AEPA revealed also that there are no actually specific noise sensitization directives even though there are directives on noise control measures. However, there are no strong national and city level strong institution. In addition to these there are no technical and financial guidance and frameworks as a result most of the noise control measurements have been practiced without any framework when complaints arise. At city and sub city levels there are no early noise sensitization and monitoring in areas of the city most susceptible to environmental noise pollution exposure. The desk review on compulsory documents results also indicated there are no provision or special laws that indicate or show detail noise control prevention. The existing EP and environmental pollution control proclamation ignores the noise issues. Besides to this there is no clear implementation procedures

how noise exposure problem should be measured or controlled. However, in line with the federal proclamation the city administration has enacted different rules and regulation.

Result from Field Level Workplace Noise Monitoring and Detection/ Computation

As important objective and practical aspects of the present study, a field level on site environmental noise level measurement and monitoring by using a parameter for investigating the status and situation in the industrial sites by using scientific technique was done. Understanding the prevalence of noise level can be managed based on the category of the area by differentiating the source, level, and time of noise pollution occurrence in different settings.

In this section of the result chapter, findings related to the field level noise computation in the study areas is presented in for different settings and scenarios mainly in reference to noise computation reference manual or table. The time and duration of the field level measurement was done for five different days by using a sound level measurement device. The process and procedure involved in measuring and computing on site noise are presented in the discussion. The morning and evening noise level and the mean noise level as presented in table 12 below.

The detail steps and procedures of computation followed or involved is outlined below. The practical on-site workplace noise monitoring or assessment was conducted for 5 days with an interval. In these five monitoring days, the noise exposure for most employees and residents of the study area was 87dB. The employees had been working with a work shift of from 8 am to 5:30 from Monday to Saturday with a break of 30 minutes morning and afternoon and 30-minute lunch. Both breaks and lunch time are in an area below 80db exposure which was not integrated or considered in the computation as it was not significant. Thus, the actual monitored workplace noise exposure of the employees was a s follow:

Exposure

Actual exposure (subtracting the lunch time and work breaks from the employee's work shift) indicate 87 dbA exposure for 7.5 hours. D=100 (C1/T1) =100(7.5/8) =94(94%)

D=100*(C1/T1) =100*(7.5/8) =94%

Time weighted Average (TMA):

From Table reference of noise exposure computation(Table HT2) , a noise exposure of 94 % converts to an equivalent 8 hour time weighted average of 89.6 d B A .Based on the computation result, since the enterprise employee's time weighted average is between 85 and 90 d B A TWA, the action to be taken by the employee and the enterprise owners should be development of a hearing loss prevention program must be maintained including hearing protection, training and audio meter testing. In general, the finding of the field level monitoring assessment indicated the enterprise workplace noise exposure was higher than the noise limit standard set for industrial areas.

The actual prevalent difference is higher by about 14.6 d B A i.e. 89.6-75=14.6 dB. The sensitivity to noise is usually greater at night-time than it is during the day, by about 10dB (A). Ideally, if the total noise level from all sources is considered, the noise level at sensitive locations should be kept within the following values

The adherence of the enterprises to existing national and city level noise protocols and different standards. Based on the perceived opinion of the survey respondents out of the total respondents of the survey, the vast majority 71.5% replied disagree that confirm the absence of the adherence to existing noise limit regulation. Also, the parallel interview secession conducted with different groups of participants confirmed the same result that ascertained the absence of compliance to the existing regulation. Prior studies conducted for different purposes in study area demonstrated also that although noise pollution is a major problem of the city and despite there are rule and

regulations against emitters the implementation and enforcement of the existing laws is extremely poor. Likert Scale Survey Data Mean Score Result

Overall total items weighted average value/ mean value analysis results on the perception /insight of the survey respondents on work place noise pollution exposure state of affairs, based on a Likert type item responses designed at a 5 point interval scale/level (1: SD, 3: SLA to 5: SA) composed of a total number of 20 items for N= 421 indicates, a calculated weighted average value/mean value of M= 2.58 & a Std. deviation of 0.902 .

Mean score value classification <3.39 low or inadequate/ poor, 3.40 to 3.79 moderate and sufficient and > 3.89 as high and good enough (Zaid Aton and Bagheri 2009). Generally interpreting the calculated weighted average value/mean value M=2.58 < 3.39 implies or tells us that, most of the respondents did not regard noise pollution as a real environmental problem in most of the survey statements for the underlying construct measured on: Insight to Workplace noise pollution exposure situation.

Finally, the study appeared to conclude/ capture that, the respondents had low insight /felt thoughts to workplace noise pollution exposure situation as real problem.

The relative low Std. deviation value of 0.902 indicates or tells us the distribution of data set/scores are closely located or not further away to the mean or not spread-out from the mean.

Conclusions and Recommendations

Conclusions

The present study was conducted with the general objective of investigating and evaluating workplace noise pollution exposure in selected office, house and household manufacturing enterprises and industrial areas by covering sample workers and residents. To research the issue some 50 furniture manufacturing enterprises were considered as sample unit of analysis including adjacent neighborhood residential areas. A total of 421 sample respondents from both groups were involved. A survey questionnaire, interview and field or on-site noise level measurement by using sound measurement device was done. In parallel to the collection of data via survey questionnaire, interviews, document reviews, field on site observation and noise level was assessed scientifically. The interview result held indicated also that, only inspection of large industries and some noisy parts of the city areas is commonly monitored and focused priority areas, but noise pollution exposure issues in enterprises located around in mixed residential areas didn't get enough focus. Also, it was discovered that community awareness creation programs done in relation to noise pollution was totally absent. As a result of the overall due to uncontrolled and unpleasant noise generated from the enterprises as main sources, the environmental quality of the surrounding area is affected in several ways as observed during the field concise survey and based on interview reports compiled.

As reported by some selected key informant residents and observation during the survey the common effects of noise felt and seen in the study area includes irritation, speech interference, sleep trouble, stress, anger, hearing problem, lack of concentration, communication hindrance, work effectiveness as well as difficulties in resting.

Recommendations

Based on the actual result and findings of the study the following potential recommendations are suggested to address the identified gaps and problems as stated below:

- Regular& successful monitoring, surveillance and follow-up in limiting the level of uncontrolled noise level around small and medium scale manufacturing zones that are found in mixed residential areas should be obligatorily done as major task by the sub-city or local administrator.

- There should be serious curiosity on future growth scenario and land use development of the city guided inconsideration to the city planning regulation, proclamation, policy & structural plan in minimizing the problems. These may include separation of residential areas from industrial areas.
- Workplace noise assessments and occupational noise monitoring should be carried out to ensure that workers' and local affected/people hearing is protected from excessive noise at their place of work.
- Instituting & enforcement of the different existing noise and environment pollution control & regulatory proclamation and standards should practice in an effective way.
- As all enterprises workers and surrounding resident respondents did not use any form of noise hearing protection device, the company owners and relevant law control and enforcing agency should seriously implement the safety rules.
- For successful noise control and effective noise proclamation and guideline implementation or compliance adherence purpose, community continuous awareness creation program for noise prevention should be done.
- Based on the opinion survey result and actual on-site field observation, the level of precaution and safety measures followed during operation activity by the enterprise workers was in risky manner and dangerous for the health and wellbeing as the extent of the noise is high, hence it is imperative to apply mandatory and serious enforcement of actions for the safety rules and codes adherence.
- The installation of different noise limiting and minimizing technology and personal noise prevention devices around noise risk enterprises areas should be done as mandatory standard.
- Based on the prevalent condition and situation of the noise monitoring exposure result and level, effective mitigation measures that includes land use planning measures, effective policies and guidelines implementation is essential to mitigate the problem
- For sustainable and long lasting successful environmental noise pollution control, mitigation and prevention purpose, the introduction of the fundamental principle of the Polluter pays and prevention action with precaution is important.
- There should be a firm commitment, integration and follow-up on the part of the government, regulatory and control agencies including relevant actors for effective implementation & realization of existing policies, standards and proclamation.
- In general, applying or placing legal, engineering and educational measures should be done in parallel
- The cultivation of workers and residents level awareness related to noise pollution and its impacts should be done

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4.6. Analysis of Cluster Wheat Farming Technical Efficiency of Smallholder Farmers: The Case of Sebeta Hawas District, Oromia Regional State, Ethiopia

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Abstract

This study aims to evaluate the impact of cluster farming on the agricultural productivity and technical efficiency among smallholder farmers in Ethiopia, an initiative promoted by the government to enhance the use of agricultural technology. A multi-stage sampling procedure was adopted to select a sample size of 326 farmer household heads, comprising 161 participating in cluster farming and 165 not involved in such practice. The stochastic production frontier model was employed to assess farmers' mean technical efficiency and factors influence farmers technical efficiency Additionally, the study utilized propensity score matching to examine the effects of cluster farming on productivity and technical efficiency. The findings indicate that farm size, fertilizer, and labor significantly and positively influence productivity, whereas the number of seed, herbicides, and oxen hour have a significant negative impact. The mean technical efficiency was observed to be 96.1% among cluster farmers and 95% within the non-cluster cohort, suggesting a modest but meaningful efficiency advantage for those engaged in cluster farming. Moreover, the study revealed that cluster farming raises the mean level of technical efficiency by approximately 0.012% and increases average productivity by 7.7% compared to non-cluster farming, when controlling for other factors. Consequently, we recommend the expansion of the cluster program to all farmers, the assessment and regulation of seed and chemical quality and quantity, the provision of targeted training on input usage, and the reinforcement of farmer unions to bolster productivity and efficiency gains among smallholder farmers in Ethiopia.

Key words *Cluster farming, Propensity score matching, productivity, efficiency, and wheat*

Introduction

Africa faces a significant disparity between wheat supply and demand, with a substantial gap existing between production and imports. From 2009 to 2011, Africa produced approximately 23 million tons of wheat but imported around 36 million tons, resulting in a 59 million tons deficit. In the countries located south of the Sahara, the figures show an average production of 5.6 million tons and imports of 12.7 million tons. This considerable gap raises concerns among policymakers due to factors such as increasing wheat prices, price fluctuations, trade and climate policy changes affecting supply, and limited foreign exchange earnings. Economic and demographic changes have led to a rapid increase in wheat demand, making countries more reliant on imports, thereby increasing their vulnerability. In sub-Saharan Africa, wheat consumption trends are rising at a faster rate compared to other major food crops (Sonder & Smale, 2013).

Large-scale commercial farmers predominantly produce wheat in sub-Saharan Africa, with smallholder farmers potentially facing economic repercussions due to market shifts towards large-scale production or international sourcing (Mason et al., 2012). Ethiopia presents a contrasting agricultural model, characterized by subsistence farming and smallholder dominance, with critical crops including teff, wheat, maize, barley, and sorghum. The agricultural sector significantly contributes to Ethiopia's GDP (46%), employment (85%), and export value (75%), despite its reliance on rain-fed systems and the

prevalence of smallholder farms covering 96% of cultivated land (Chimdessa et al., 2022; Mottaleb et al., 2021)

Wheat, as the third most important crop in Ethiopia, plays a crucial role in the diet and economy, although domestic production does not fully meet demand, leading to substantial imports (Mottaleb et al., 2021). The significant dependency on imported wheat due to insufficient domestic output, driven by factors such as limited modernization, reliance on rainfall, and resource constraints, positions Ethiopia vulnerably in the context of international conflicts and trade dynamics (Rachel, 2022). Despite these challenges, Ethiopia has the potential to enhance wheat production through available land, favorable climate, and labor resources. The government's strategic interventions, including the Wheat Sector Development Strategy and cluster farming, aim to increase productivity and self-sufficiency, although achieving this goal necessitates overcoming substantial hurdles, including outdated farming techniques, irrigation limitations, and capacity constraints (Rachel, 2022).

A detailed examination by the International Food Policy Research Institute (IFPRI) in 2015 on crop production rankings in Ethiopia identified the top 100 wheat-producing districts (woredas) predominantly in Oromia, Amhara, and Tigray regions. Notably, the highest density of productive woredas emerged in the Arsi-Bale area of Oromia, spotlighting a significant "wheat belt" where most leading wheat production sites are clustered (IFPRI, 2015). Sebeta Hawas District, ranking among the top wheat producers in the Oromia region, confronts several productivity challenges. These include reliance on seasonal rainfall without support from irrigation, limited availability of improved seeds and fertilizers, lacking financial and advisory support, subsistence focus of production, and the constraint of small agricultural landholdings per farmer.

Despite ongoing wheat farming practices in Sebeta Hawas, a discerning gap in research concerning the technical efficiency of cluster versus non-cluster farming methods among smallholders in this district has been identified. To address this knowledge gap, an impending study aims to estimate and compare the mean technical efficiency between smallholder farmers engaging in cluster and non-cluster wheat production. Furthermore, it will scrutinize factors leading to technical inefficiencies and gauge the impact of governmental cluster farming initiatives on wheat productivity and smallholder livelihood efficiency (IFPRI, 2015).

The methodology centered on the stochastic production frontier model is chosen for its robustness in accounting for inefficiency due to uncontrollable factors and technical errors, promising insightful deductions about the effectiveness of cluster farming methodologies in enhancing wheat production efficiency.

This innovative study aspires to produce comparative insights on the technical efficiency between cluster and non-cluster smallholder wheat producers, particularly highlighting the effectiveness and limitations of the cluster farming approach in Sebeta Hawas District. Through examining the nuances of government interventions in cluster farming, the research anticipated offering updated information on the technical efficiency of clustered farming approach. The findings could inform future agricultural policies and strategies tailored to bolster wheat production efficiency among smallholder farmers in Ethiopia, elevating both productivity and socio-economic conditions within the agricultural sector.

Methodology

The study was conducted in Sebeta Hawas District which is in the former special zone around Finfinnee (now called Shegger City) of Oromia Regional State in central highlands of Ethiopia at 24 km west of Addis Ababa.

Sebeta Hawas District is in Ethiopia, bordered by Akaki district to the east, Qarsaa and Tolee districts to the south, Walmaraa district to the north, the city of Addis Ababa to the northeast, and Iluu and

Ejeree districts to the west. The district lies between 8° 44' 59.99" N latitude and 38° 39' 59.99" E longitude. It experiences an average annual rainfall of approximately 1100 mm, with the majority occurring during the main rainy season from June to September. The altitude ranges from 2200 to 2600 meters above sea level, and the average annual temperature ranges from 6 to 21°C. The district is predominantly characterized by a highland (Woyenadega) climate, accounting for 88%, with the remaining 12% classified as mid-highland (Dega) climate. Sebeta Hawas District consists of 36 rural and 4 urban kebeles, with a total population of 189,912 (97,150 male and 92,762 female) based on a 2022 population projection. The district's economy is primarily based on a mixed crop-livestock farming system. Agriculture occupies 87.2% of the land, followed by pasture (4.2%), forests (2.9%), reserved areas for industrial establishments (1.86%), lakes and water bodies (1.68%), and built-up land (1.28%). The main crops cultivated in the district include teff, wheat, barley, and beans (SHDANRO).

Data and Methods of Data Collection

The study used a combination of primary and secondary data sources. Primary data was collected from smallholder cluster wheat farmers and non-cluster (demonstration) farmers in the study area, while secondary data was obtained from the Sebeta Hawas District Agriculture and Natural Resources Office (SHDANRO) and other published articles related to the study topic. Both quantitative and qualitative types of data were collected through household-level cross-sectional primary surveys and secondary data sources.

Sampling and sample size determination

The study used a sample size calculation formula based on a two-step procedure suggested by "CueMath" (n.d.). The formula uses the following variables: P (target population proportion), S (sample size for the infinite population), Z (Z-score, which is a constant value set automatically depending on the confidence level), and M (margin of error). We assumed target population proprtion of 5%, confidence level used was 95%, the Z-score was 1.960 amd margin of error of 5%.

Hence, the sample size for infinite population: $S = \frac{Z^2 * P(1-P)}{M^2}$ and, the adjusted sample size will be:

$$AdjustedSampleSize = \frac{S}{1+\frac{S-1}{P}} \quad (1)$$

A three-stage sampling procedure was employed: in the first stage- Sebeta Hawas District was selected purposively; in the second stage, 9 kebeles (4 from clustered and 5 from non-clustered schemes) were selected using systematic sampling procedure from 31 clustered and 5 non-clustered kebeles, respectively; and finally, 326 smallholder households from these 9 kebeles were selected using simple random sampling method.

Using equation (1), the adjusted sample size is 326. Next, using sample size estimation formula for strata groups given by Vallejos & Acosta (2021), proportional sample sizes for clustered and non-clustered groups were determined: for clustered group $n_C = \frac{n \times N_C}{N}$; and for non-clustered/usual group $n_U = \frac{n \times N_U}{N}$: where, n_C is the sample size for the clustered group, N_C denotes the target population of the clustered group, n_U stands for sample size for the non-clustered/usual group, and N_U = target population for the non-clustered/usual group, N is the target population for both groups, and n is the total sample size for both groups. The sample size for each group is computed and shown in Table1 below:

Table: Sample sizes for the clustered and the non-clustered groups

S/No.	Group	Household size	Sample size
1	Clustered	1071	$n_C = \frac{n \times N_C}{N} = \frac{326 \times 1071}{2160} = \frac{349{,}146}{2160} = 162$
2	Non-clustered/Usual	1089	$n_U = \frac{n \times N_C}{N} = \frac{326 \times 1089}{2160} = \frac{355{,}014}{2160} = 164$
Total		2160	326

Source: - Own computation (2023)

Methods of data analysis

Econometric model specification

In this section, we delve into the process of selecting and defining econometric models for efficiency estimation and propensity score matching analysis.

Stochastic Specification of Technical Efficiency

The stochastic frontier analysis (SFA) is a method of frontier estimates that assumes a specific functional form for the relationship between inputs and outputs (Coelli et al., 2005). The stochastic production function model was initially proposed by (Aigner et al., 1977) and (Meeusen and Broeck, 1977). Liu (2017) further proposed stochastic production models that estimate both the parameters of the stochastic frontier and the inefficiency functions simultaneously. In the stochastic frontier model, a non-negative error term representing technical inefficiency is subtracted from the traditional random error in the classical linear model. The general formulation of the model is as follows:

$$y_i = \beta_1 + \beta_2 x_{i2} + \beta_3 x_{i3} + \ldots + \beta_k x_{ik} + \varepsilon_i, \varepsilon_i = v_i - u \quad (2)$$

The production function for a farmer is represented by output y_i and inputs x_j. It is assumed that y_i is a function of x_j, where β represents the parameters, and ε and u are independent random variables. The error term (ε) consists of a standard white-noise disturbance (u) and a one-sided component (v) given by. The term v captures the effect of inefficiency. Earlier studies on the stochastic production frontier calculated the mean technical inefficiency of firms, as individual observations could not be separated into components. Jondrow et al. (1982) addressed this issue by describing the functional distribution of the one-sided inefficiency component and deriving the conditional distribution of v for two common distribution cases (exponential and half normal). This allowed for the evaluation of firm-specific technical inefficiency. In this thesis, the production function for the farmer is given by

$$y_i = A\prod_{j=1}^{k} x_j^{\alpha_j} e^{v} \quad (3)$$

where y_i is output, and x_j are exogenous inputs. A is the efficiency parameter and v is the stochastic disturbance term? The production function in (1) is related to the stochastic frontier model by Lovell and Schmidt (1977) who specified A as:

$$A = a_0 e^{-u} \quad u \geq 0, \quad (4)$$

a_0 is a parameter common to all farmers and u is the degree of technical inefficiency different from farmer to farmer? Farmers for whom $u = 0$ are utmost efficient. A farmer is called technically inefficient if output is less than the maximum possible rate defined by the frontier. The term v is the usual two-sided error term that represents shifts in the frontier due to favorable and unfavorable external factors

and measurement error. After including the component of inefficiency (i.e., e^{-u}), the actual production function is written as:

$$y_i = a_0 \prod_{j=1}^{k} x_j^{\alpha_j} e^{(v-u)} \quad (4a)$$

The stochastic production frontier is a suitable method for studying technical efficiency because it accounts for factors that may influence a firm or farmer but are beyond their control. These factors include unfavorable weather conditions, crop pests, and diseases like wheat rust, which can affect wheat farming. Measurement and observation errors can also occur during data collection. To address these issues, this study utilized the stochastic frontier model. The stochastic frontier analysis was introduced by Aigner et al. (1977) and Lovell (1977). It separates the deviation (error term) into two components: technical inefficiency, which captures factors under the control of the farmer, and random shocks (white noise), such as bad weather conditions, measurement errors, and omitted variables. In this study, the Cobb-Douglas production function was used, which is one of the commonly employed functional forms in production studies, along with the translog function. The production frontier is

$$\ln y_i = f(x_{j,i};\beta) + \varepsilon_i \quad (5)$$

Where, $\varepsilon_i = v_i - u_i$ with $v_i \sim N(0,\sigma_v^2)$ and $u_i \sim N(0,\sigma_u^2)$

From equation (1), we have:

$$y_i = \exp f(x_{j,i};\beta) \times exp(v_i) \times \exp(-u_i) \quad (6)$$

Here, $f(\,)$ is a suitable functional form (in this case the Cobb-Douglas function); y_i represents the output of the i^{th} farmer; x_j is the corresponding level of inputs j of the i^{th} farmer, and β is a vector of estimated unknown parameters. The observed deviation of the actual point of production from the frontier $\exp f(v_i - u_i)$ is a composed error. The v_i is a symmetric random error, to account for statistical noise. The symmetric disturbance, v_i, is assumed to be due to uncontrollable factors such as weather, making the frontier stochastic. And u_i is a nonnegative variable associated with the technical inefficiency of the farmer. The statistical noise arises from the inadvertent omission of relevant inputs as well as from measurement errors and approximation errors with the choice of functional form. The Cobb-Douglas form of the stochastic frontier production employed in this study is expressed as follows:

$$\ln y_i = \beta_0 + \sum_{j=1}^{k} \beta_j \ln x_{j,i} + v_i - u_i \quad (7)$$

The input variables and the output variable that were used in the frontier model were: The amount of wheat harvest in quintals per hectare (**outputperha**) during the production period of 2021/2022, is the dependent variable of the model; land (**landsz**) is the total hectare of farm land covered by wheat per farmer during the production period of 2021/2022 in hectare; labor (t**labor**) is labor day (the number of days) during which a family labor and a hired labor worked in wheat agricultural farming; oxen (**oxenh**) is the number of hours a pair of oxen had ploughed the land for wheat farm; fertilizer (**fertilizer**) is the composition of UREA and NPS in kilograms which a farmer used; chemicals (**herbic**) is chemicals in liters a farmer used for the purpose of prevention of weeds; improved seeds/seed (**qttyofseed**) it is the wheat improved/local seed in kilograms a farmer used. The model showing the relationship between the above inputs and the output variable is specified as follows:

$$\ln(outputperha) = \beta_0 + \beta_1 \ln(landsz) + \beta_2 \ln(tlabor) + \beta_3 \ln(oxenh) + \beta_4 \ln(qttyofseed) + \beta_5 \ln(herbic) + \beta_6 \ln(fertilizer) + \varepsilon_i \quad (8)$$

β_0 is an intercept (constant) and $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$, and β_6 are the slope parameters to be estimated. As described in the literature section of chapter two, the technical efficiency of a farmer is defined as the ratio of the observed output y_i to the maximum feasible (frontier) output in an appropriate environment, defined by a certain level of inputs used by the farmer. Thus, technical efficiency of firm i can be expressed in terms of the errors as:

$$TE_i = \frac{y_i}{Y_i} = \frac{\exp f(x_{j,i};\beta_i) \times \exp(v_i) \times \exp(-u_i)}{\exp f(x_{j,i};\beta_i) \times \exp(v_i)} \quad (9)$$

$$TE_i = E\left[\exp(-u_i) \mid (v_i - u_i)\right] \quad (10)$$

Equation (1) implies the mean of the exponent of technical efficiencies, conditional on the error, ε_i (equation 1). Since u_i is a nonnegative random variable, these technical efficiencies lie between 0 and 1, where unity indicates that this firm is technically efficient. Otherwise $TE_i < 1$ provides a measure of the shortfall of observed output from maximum feasible output in an environment characterized by $\exp(v_i)$, which allows for variation across producers. Commonly used method for estimation of a stochastic frontier is the maximum likelihood (ML) method. ML estimations rest on the assumption that the distribution of the errors is actually known (Ngango & Kim, 2019).

Battese & Coelli, (1995) suggested a model to measure technical inefficiency which can be called as technical efficiency score for the i^{th} farmer, which can be expressed as in the following equation:

$$TE_i = \exp(-u_i) = \exp(-Z_i\alpha - W_i) \Leftrightarrow u_i = Z_i\alpha + W_i \quad (11)$$

The inefficiency effects model of equation (10) can be given as follows:

$$u_i = \alpha_0 + \sum_{k=1}^{n} \alpha_k Z_{j,k} = \alpha_0 + \alpha_1 Z_1 + \alpha_2 Z_2 + \alpha_3 Z_3 + \ldots + \alpha_i Z_i + W_i \quad (12)$$

Where u_i is the non-negative random variable indicating technical inefficiency; α_i are coefficients of the explanatory variables to be estimated; Z_i is the set of explanatory variables representing the socio-economic characteristics of the target farmers of the study, W_i is the error term of the model.

The analysis of the impact of cluster farming on the technical efficiency of smallholder wheat farmers in the study area utilized a Logit model. In this study, "Cluster" refers to farmers who participated in cluster farming, while "non-cluster" refers to those who did not participate in cluster wheat farming during the previous farming season (2021/2022). The model assumes that both clustered and non-clustered smallholder farmers had similar characteristics before the specified crop year, which was 2019/20. To estimate the impact of the average treatment on the treated (ATT), the term "clustering" was used to indicate the probability of cluster participation. The term "impact" represents the change in mean technical efficiency and average productivity (measured as wheat output in quintals per hectare) resulting from participating or not participating in cluster farming. Propensity score matching (PSM) was employed to evaluate the impact of cluster farming on the technical efficiency of wheat farmers. $\Delta Y = Y_1 - Y_0$ (13)

Where, ΔY is the average impact of cluster farming, Y_1 is the potential outcome conditional on being participated in the cluster program, and Y_0 represents potential outcome conditional on being participated in non-cluster. The PSM was computed using Logit model given by:

$$P(X) = \Pr(D = 1 | X) = E(D | X) \quad (14)$$

In this case, $D = (0,1)$ shows participation to cluster farming, $D = 1$ means a unit received treatment, i.e., participated in cluster and $D = 0$ means it didn't receive treatment, i.e., didn't participate in cluster. The average treatment on the treated (ATT) was estimated, X is the set of covariates by which the subjects were matched.

$$ATT = E(\Delta Y | D = 1, X) = E(Y_1 - Y_0 | D = 1, X) = E(Y_1 | D = 1, X) - E(Y_0 | D = 0, X) \quad (15)$$

The logistic model specification is as follows:

$$P(i) = \frac{1}{1 + e^{-Z(i)}} \quad (16)$$

$P(i)$ is the probability of farmer household i being participated in cluster farming and $Z(i)$ is the function of explanatory variables X_i given by:

$$Z(i) = \beta_0 + \sum_{i=1}^{n} \beta_i x_i = \beta_0 + \beta_1(age) + \beta_2(gender) + \beta_3(education) + \beta_4(hhsize) + \beta_5(distance) + \beta_6(ofarmin c) + \beta_7(ownership) + \beta_8(pslop) + \beta_9(plotdist) + \beta_{10}(TLU) + \beta_{11}(soilfert) + \beta_{12}(numbofplot) + \beta_{13}(landsz) \quad (17)$$

In equation (16), the tropical livestock unit (TLU) is the indicator of the total livestock resources of a farmer; β_0 is the slope parameter; $\beta_1, \beta_2, \beta_3, ..., \beta_{13}$ are intercepts (coefficients) that are to be estimated.

Results and Discussion

Analysis of the Stochastic Frontier and Cluster Farming Impact Evaluation

Socioeconomic characteristics of households

The following table shows the variables used in the inefficiency model in both cluster and non-cluster groups.

Table2: Descriptive statistics of variables of inefficiency model in both groups

Variable	Obs.	Mean	Std. Dev.	Min	Max
Gender status of the household head	323		0.43	1	2
Age of the household head	323	53.7	9.52	25	77
Household size	323	6.6	2.62	2	15
Education level of the HH head	323	1.44	0.58	1	3
Number of plots	323	1.22	.43	1	3
Plot distance	323	2.32	1.19	.5	7
Distance	323	3.21	2.87	1	33.5
Experience	323	13.51	9.33	2	42
TLU/number of livestock resources	323	34.8	14.84	1.8	92
Market access	323	1.30	0.46	1	2
Extension frequency	323	81.02	27.4	4	196

In cluster group, the average wheat output per hectare was 42.5 quintals, ranging from 36 to 69 quintals. In non-cluster group had an average output of 29.5 quintals per hectare, ranging from 9 to 70 quintals. The average land size for wheat farming was 1.62 hectares, with a range of 0.5 to 4 hectares. The average number of labor days spent on wheat farming was 103.85 days, ranging from 5 to 256 days. The cluster group worked an average of 97.16 hours with oxen, ranging from 19 to 224 hours. The

average amount of wheat seed used was 220.3 kilograms, ranging from 65 to 600 kilograms. Herbicide application ranged from 0.5 to 4 liters, with an average of 1.6 liters.

Farmers' productivity and technical efficiency analysis

Land size, Fertilizer, and Labor*:* These variables affected the smallholder farmers' productivity positively and highly significantly (at 1% significance level). It shows that a 1% increase in farm size is associated with a corresponding 0.1 % increase in productivity level; A 1% increase in the amount of fertilizer on average increased output by about 1.3% and, a 1% increase in labor days resulted in about 0.1% rise in productivity on average ceteris paribus, This finding coincides with the finding of Dessale (2019).

Table: Description of variables used in estimation of stochastic frontier model

Variable	Obs.	Mean	Std. Dev.	Min	Max
output	323	60.6	40.1	6.75	207
landsz	323	1.6	.81	.5	4
laborday	323	103.9	53.71	5	256
oxenh	323	97.2	32.86	19	224
qttyofseed	323	220.3	111.2	65	600
herbic	323	1.60	.83	.5	4
fertilizer	323	373.86	196.5	100	1000

Source: own computation (2023)

Herbicides, Oxen hour and Quantity of seed*:* These variables affected production negatively and significantly at 0.5%, 10% and 1% respectively. Ceteris paribus, a 1% increase in this chemical on average reduced production of wheat by about 0.1%; a 1% increase in oxen hour resulted in about 0.04% reduction; and a 1% increase in the amount of wheat seed results in the declining of production by about 0.3%, becoming a challenge to farm productivity. The study by Gaba et al. (2016) pointed out that herbicide application rate didn't affect weeds or wheat productivity. The use of this chemical couldn't ensure wheat productivity probably be since the increasing use of a limited type of this chemical above the recommended amount can result in the weed resistance against the herbicides; and there might happen weed species increase over time that could make reverse the herbicides' effect on weeds.

The marginal effect analysis result shows that the aggregate sum of the coefficients is 1.041, indicating that the elasticity of the frontier parameter, and hence the frontier's increasing returns to scale.

The analysis of the frontier production function revealed that the overall sum of the six elasticity coefficients was 1.041, indicating increasing returns to scale. A comparison of technical efficiency between cluster and non-cluster groups was conducted. In the cluster group, the mean technical efficiency (TE) of farmers was 96.1%, with a minimum TE of 88.2% and a maximum TE of 98.4%. The average technical inefficiency (TI) level was 3.9%, suggesting that these farmers could increase wheat output by this amount without using additional inputs. In contrast, the mean TE of farmers in the non-cluster group was 95.0%, with a minimum TE of 66.7% and a maximum TE of 96.9%. The mean TI level was 5%, implying that farmers in the non-cluster group could increase output by 11% without increasing their inputs. There was a significant variation of about 30.2% in the TE levels within the non-cluster group. Furthermore, a comparison between the cluster and non-cluster groups revealed that farmers in the cluster group were, on average, 1.1% more efficient in wheat production than those in the non-cluster group.

Table 4: Technical efficiency between cluster and non-cluster farming

Clustering	Obs.	Mean TE	Std. Dev.	Min	Max
Cluster	159	0.961	0.016	0.882	0.984
Non-cluster	164	0.950	0.026	0.667	0.969

Factors that affected the technical efficiency of the smallholder farmers

Clustering: Participation in cluster farming is negatively and significantly related to technical inefficiency. This means that cluster participation has a decreasing effect on technical inefficiency, reducing it by approximately 2%. This relationship is statistically significant at a significance level of 1%.

Age: The age of the household head has a significant and positive impact on the technical inefficiency (TI) of smallholder farmers in wheat farming at the margin, with a significance level of 4%. Older household heads tend to be more technically inefficient. This finding is consistent with similar studies conducted by Adams (2020) and Yami et al. (2013). However, it contradicts the findings of (Dessale, 2019), who found that age had a significant and negative impact on TI at a significance level of 5%, indicating that older farmers were more efficient than younger ones.

Education: The education level, measured in years of schooling, of a household head had a negative effect on technical inefficiency, but the average marginal effect was statistically insignificant. Specifically, a one-unit increase in education level decreased technical inefficiency by 0.021%. This finding is consistent with the results of Kaleb & Workneh (2016), who studied the efficiency of agricultural production in Ethiopia and found that farmers with higher levels of education exhibited lower levels of inefficiency. However, it contradicts the findings of Adams (2020), who stated that illiteracy and primary school education had a negative impact on technical inefficiency, while secondary school education had a positive impact. The researcher also added that while education at some level contributes to technical efficiency, further education could lead to increased technical inefficiency.

Household size: The household size (the number of family members in a farmer household) had a negative effect on technical inefficiency, but the effect was statistically insignificant. Holding other variables constant, a one percent increase in household size was associated with a reduction in technical inefficiency of approximately 0.03% at the margin. This could be attributed to the potential utilization of household members, particularly those in the working age, as a source of labor for wheat agriculture activities. Additionally, if the main labor source is within the household, there would be cost savings in terms of hiring external labor. This finding is consistent with the results of Wana (2019). However, it contradicts the findings of Adams (2020), which indicated a positive relationship between the coefficient of family size and technical inefficiency.

Land fragmentation*:* Land fragmentation refers to the number of plots of land owned by a smallholder farmer household head. This variable had a negative effect on farmers' technical inefficiency, but the effect was statistically insignificant at the margin. Holding other factors constant, a 1% increase in the number of plots was associated with a decrease in inefficiency by approximately 0.05%. This finding aligns with the study conducted by Akinyemi (2017), which explored the effects of land fragmentation on the technical efficiency of cassava farmers in Nigeria. Akinyemi found that an increase in the fragmentation index led to a higher technical efficiency among cassava farmers in the study area. The argument was that farmers who cultivated more plots were more technically efficient compared to those cultivating fewer plots. However, this finding contradicts the results of Ayele et al. (2019) and Adams (2020), who found that as the number of plots increased, farmers might encounter difficulties in effectively managing all the plots.

Membership: The membership of a farmer household head in associations such as farmer unions and credit unions have an indirect relationship with technical inefficiency. While the coefficient is negative, indicating a potential decrease in inefficiency, the average marginal effect is statistically insignificant. Holding other variables constant, a 1% increase in membership is associated with an average decrease in technical inefficiency of approximately 0.1%. This suggests that farmers who are members of critical farmer-based associations gain access to services such as seeds, timely information, credit, and valuable experiences, which contribute to increased technical efficiency. This finding is consistent with the results of Adams (2020).

Plot distance: Plot distance refers to the average distance, in kilometers, between wheat farm plots and the home of a farmer household. This variable had a negative effect on the mean technical inefficiency (TI) of farmers, but the effect was statistically insignificant at the margin. Holding other factors constant, a 1% increase in distance was associated with a decrease in farmers' TI by approximately 0.01%. This suggests that farmers who are farther from their farm plots tend to be more efficient in wheat production. This finding is consistent with the results of Adams (2020), which indicate that farmers residing further away from their farm areas engage in more farming activities compared to those living closer to their plots. It also aligns with the findings of Wudineh & Endrias (2016), which suggest that farmers in distant areas operate farm activities more efficiently due to the availability of additional off-farm activities that farmers near the farm location spend more time on. However, this result contradicts the findings of Dessale (2019), who found that the farther the plot site of a wheat farmer household head from home, the more inefficient they are, assuming all other factors remain constant.

Extension frequency: The variable represents the frequency of contact between agricultural extension service workers and smallholder farmer household heads. Surprisingly, the analysis revealed that a higher frequency of extension visits had a positive and significant effect on technical inefficiency, contrary to expectations. Specifically, a 1% increase in extension visits led to an average increase in technical inefficiency of approximately 0.08%, assuming all other factors remained constant. Possible reasons for this unexpected finding include farmers potentially wasting time on training activities instead of focusing on farming, inadequate support provided by extension workers, provision of irrelevant extension services, or potential selection bias where the farmers who needed the most assistance were not contacted by extension workers. This research finding aligns with the study conducted by Wassie (2014), which also found a positive and significant relationship between extension frequency and technical inefficiency. However, it contradicts the findings of Adams (2020) and Wudineh & Endrias (2016).

Distance: This variable measures the average distance between basic infrastructural units (such as markets, veterinary clinics, farmers training centers, health centers, schools, and credit unions) and a farmer's residence. It had a positive effect on farmers' technical inefficiency (TI), but the average marginal effect was found to be insignificant. This outcome aligns with expectations, indicating that the greater the distance between a farmer and essential infrastructural facilities, the more likely the farmer is to experience inefficiency in their agricultural activities. Distance can consume time, money, and effort, leading to decreased efficiency for farmers.

Tropical livestock unit (TLU): The variable had a negative and significant effect on TI (technical inefficiency) at the margin, with a significance level of 6%. Holding other factors constant, a 1% increase in TLU (total livestock units) resulted in a decrease of approximately 0.07% in TI. This suggests that as the household head farmer possesses more livestock resources, their technical inefficiency in wheat farming decreases. This finding is consistent with a similar study conducted by Wassie (2014), which also found that livestock ownership had a negative impact on technical

inefficiency. Livestock can contribute to crop production in various ways, including providing income, serving as draft power, and maintaining soil fertility using Manu

Propensity score matching

In this study, a logistic regression model was used to estimate propensity score matching (PSM) for matching smallholder wheat farmer household heads in the cluster group (treatment receivers) with those in the non-cluster group (control). Covariate variables that influenced the intervention and outcome but were unaffected by the intervention were included (Brandes et al., 1983). The balancing test indicated that, after matching, the differences between the treatment and control groups for each covariate were statistically insignificant. This ensured proper balance between the matched groups based on common support and propensity scores. The sensitivity analysis confirmed the robustness of the estimated average treatment effect on the treated, indicating the absence of hidden bias from uncontrolled confounders. The figure below shows a histogram of the propensity scores for the treated group, untreated group, and treated cases outside the support region.

The impact of cluster farming on smallholder farmers' technical efficiency

To assess the impact of cluster wheat farming on technical efficiency, the average treatment effect on treated (ATT) was estimated using Stata 15.1. The logistic regression model was employed, with the mean technical efficiency level (*te*) as the outcome variable and clustering as the dependent variable. Clustering indicated whether a smallholder farmer household head belonged to the cluster group (treatment) or the non-cluster group (control). The table below presents the results of the average treatment effect on treated (ATT) and the coefficients from the logistic regression analysis.

Table 5: The logistic model regression result showing impact of cluster farming on technical efficiency

```
Logistic regression                               Number of obs     =        323
                                                  LR chi2(13)       =      89.80
                                                  Prob > chi2       =     0.0000
Log likelihood =  -178.9495                       Pseudo R2         =     0.2006
```

clustering	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
age	-.0200397	.0207544	-0.97	0.334	-.0607175	.0206381
gender0	.5520659	.3182794	1.73	0.083	-.0717502	1.175882
educ0	.0274224	.2587572	0.11	0.916	-.4797324	.5345773
hhsize	-.0094092	.0737042	-0.13	0.898	-.1538667	.1350484
distance	-.0982035	.0861401	-1.14	0.254	-.267035	.0706279
ofarminc	.000028	7.75e-06	3.61	0.000	.0000128	.0000432
ownership1	.3877099	.414933	0.93	0.350	-.4255439	1.200964
pslop1	-.94374	.291204	-3.24	0.001	-1.514489	-.3729907
plotdis	.1020505	.1291645	0.79	0.429	-.1511072	.3552083
TLU	-.0783665	.0168201	-4.66	0.000	-.1113334	-.0453997
soilfert1	-.6772002	.3080696	-2.20	0.028	-1.281005	-.073395
numbofplot	-.7312954	.3602821	-2.03	0.042	-1.437435	-.0251554
landsz	.7124398	.2493636	2.86	0.004	.2236962	1.201183
_cons	2.883659	1.252879	2.30	0.021	.4280611	5.339258

Variable	Sample	Treated	Controls	Difference	S.E.	T-stat
te	Unmatched	.960322858	.949282713	.011040145	.002397765	4.60
	ATT	.960539863	.948669661	.011870202	.003988577	2.98

```
Note: S.E. does not take into account that the propensity score is estimated.
```

psmatch2: Treatment assignment	psmatch2: Common support		
	Off suppo	On suppor	Total
Untreated	0	164	164
Treated	18	141	159
Total	18	305	323

Participating in wheat cluster farming had a significant effect on the technical efficiency of smallholder household heads, as indicated by the average treatment effect on the treated (ATT) value. On average,

smallholder farmers who participated in cluster agriculture were approximately 0.012% more efficient in wheat production compared to those who did not participate in cluster farming, all else being equal. The logistic regression analysis in Table 8 revealed the following key findings.

Factors affecting cluster farming

The analysis found that the age of the household head had a non-significant negative influence on participating in cluster wheat farming. In contrast, the gender of the household head had a significant effect, with male household heads being 0.55% more likely to participate compared to female household heads and the finding is in line with Hussen & Geleta (2021). Off-farm income had a significant positive impact on participation, allowing farmers to support their agricultural activities and meet various obligations. The slope of the plot and livestock resources had significant negative effects on participation, with steeper slopes and more livestock decreasing the likelihood of participating in cluster farming and the finding aligns with Hussen & Geleta (2021),. Soil fertility also had a significant negative effect, as farmers with more fertile plots were less likely to engage in cluster farming. Land fragmentation, the number of plots owned, had a significant negative impact, while land size had a significant positive effect on participation. Other factors like education, plot ownership, plot distance, household size, and distance to infrastructure had either positive or negative effects but were not statistically significant.

Conclusions and Recommendations

This research aimed to analyze the technical efficiency of smallholder farmers engaged in cluster wheat production in Sebeta Hawas District, Ethiopia. It sought to identify factors affecting their efficiency, evaluate the impact of cluster farming on efficiency and productivity, assess the opportunities and challenges of cluster wheat farming, and analyze the overall impact of clustering on smallholder farmers' productivity. Data was collected through questionnaires from 323 farmers, and the analysis employed the Cobb-Douglas functional form and maximum likelihood estimators. The study found that land size, labor, and fertilizer usage positively influenced productivity, while seed amount, herbicide usage, and oxen hours had negative effects. The research also revealed increasing returns to scale. The average technical efficiency of cluster farmers was 96.1%, with variations observed between cluster and non-cluster farmers. Factors such as age, education level, household size, land fragmentation, membership in farming organizations, proximity to plots and infrastructure, and extension contacts influenced technical inefficiency. Cluster participation had a significant positive effect on technical efficiency and increased productivity by approximately 7.71% on average. These findings indicate that the cluster farming approach contributed to efficiency and productivity gains among smallholder wheat farmers in the study area.

Based on the study findings, the following recommendations are proposed:

1. Regional government and local administration should prioritize cluster farming and facilitate the organization of non-clustered farmers with fragmented and smaller plots into clusters. They should promote experience sharing from successful cluster farming initiatives in other regions and woredas and raise awareness among wheat farmers about the benefits of engaging in cluster farming to motivate their participation.
2. Measures should be taken by the local, regional, and federal governments, as well as other relevant organizations, to improve the quality and types of chemicals used for weed control, including herbicides. Additionally, seed types and quality standards should be assessed, and appropriate training and experience sharing services should be provided to farmers and extension workers to enhance their knowledge and practices in chemical and seed usage.

3. Farmer membership in farm-based associations, such as farmer training centers, farmer unions, and farmer credit unions, has been found to significantly and positively affect technical efficiency and productivity. The local government should focus on strengthening these associations to provide timely access to farm inputs, information sharing, and peer-to-peer collaboration. Furthermore, facilitating market linkages for farmers to negotiate input and output prices is crucial, as market inadequacy was identified as a challenge.
4. The frequency of extension contact was found to negatively affect technical efficiency. To address this, local and regional government bodies should revise the aim of extension services to better align with farmers' needs. They should also conduct awareness campaigns to educate farmers about the benefits of extension services and encourage farmers to actively receive and implement support provided by extension workers.
5. Formal education expansion among the farming community should be prioritized by the government and relevant stakeholders. Education plays a vital role in fostering growth, development, and civilization. Given that agriculture is a significant pillar of the country's economy and predominantly relies on smallholder farmers, increasing access to formal education will empower farmers with knowledge and skills needed for sustainable agricultural practices and overall socio-economic development.

4.6.1.References

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4.7. Comparative Analysis of Acacia decurrens-based agroforestry user and non-user households' food security status using a multidimensional approach in Awi Zone highlands, Ethiopia

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Abstract

Agroforestry practices play a vital role in rehabilitating degraded land and, in turn, reducing rural poverty and food insecurity in Ethiopia. However, the food security effects of farmers' participation in agroforestry system remain understudied. This study aimed to examine the status and determinants of food security among Acacia-based agroforestry (ABA) user and non-user households using a composite method in Awi Zone Highlands, Ethiopia. The study employed purposive and random sampling to select sample kebeles and 416 farm-households, respectively. Data were collected through questionnaires, focused-group discussions, and interviews. Food security, being a multi-dimensional concept, was assessed using the composite Food Security Index (FSI). The composite FSI was generated from the measures of households' Months of Adequate Food Provisioning, Dietary Diversity Score, Food Consumption Score, Food Insecurity Access Scale, and Coping Strategies Index. Descriptive, inferential statistics and qualitative techniques were used for data analysis. The study found that 42.3% of the surveyed households were food secure, while 57.7% experienced food insecurity. Among ABA users, 44.9% were food secure, compared to 35.8% of non-users. The logistic regression analysis revealed that livestock holding, farmland size, participation in off-farm activities, irrigation access, tree plantations, and perceived soil quality positively affect farm-households' food security, while age, family size, credit access, and market distance negatively affect the food security status of farmers. In conclusion, ABA system positively impacts user-households' food security, but food insecurity remains high in the study area, particularly for non-users. Therefore, urgent and effective actions are needed to overcome food insecurity challenges, especially for most vulnerable households.

Keywords: *Acacia*-based, Agroforestry, Composite method, food (in)security, non-users, users

Introduction

Access to adequate and nutritious food is crucial for the health and productivity of individuals, as well as for a country's economic development (Sani & Kemaw, 2019). However, over a quarter of the global population faces challenges in obtaining scientifically recommended quantities and qualities of food daily (FAO et al., 2021). According to FAO et al. (2021) nearly 2.37 billion people (29.3% of the world population) experienced moderate to severe food insecurity, an

increase of 370 million people compared to 2019 (FAO, 2019). The number of chronically hungry people also increased from 720 million in 2019 to 811 million in 2020 (FAO et al., 2020) and 828 million in 2021 (FAO et al., 2021).

Africa is the world's least food-secure continent (Gezimu & Bahadur, 2021), with over half of its population experiencing varying degrees of food insecurity (FAO, 2019; Gezimu & Bahadur, 2021). The problem of food insecurity is much worse in Sub-Saharan Africa (SSA) (FAO, 2019; Gafa & Chachu, 2023), where one-third of its population severely food insecure (FAO, 2019) and constituted 95% of the continent's undernourished people. Ethiopia is placed at the top by the prevalence of poverty and food insecurity in SSA (Souza & Jolliffe, 2016). The underlying causes of food insecurity in Africa, especially SSA, were climate change/variability, political instability, low agricultural productivity, limited infrastructure, land degradation and fragmentation, and poor mechanization (Ayele et al., 2020; Gafa & Chachu, 2023).

Agriculture is vital for Ethiopia's economy and rural livelihoods. However, challenges like population growth, climate disruptions, land fragmentation and degradation, traditional farming practices, and conflicts have made the sector insufficient to support farmers' livelihoods (Zerssa et al., 2021). Despite abundant resources, like fertile land, favorable climate and ample water, Ethiopia's agriculture remains underdeveloped, leading to persistent poverty and food insecurity (Ayele et al., 2020). Over half of the country's population (57%) experiences food insecurity (Diriba, 2020; FAO, 2020), with a quarter below the poverty line (FAO, 2020). Ethiopia has the highest number of undernourished people (32 million) in SSA, with many relying on welfare programs (Diriba, 2020).

Like other parts of Ethiopia, subsistence mixed agriculture is the main source of livelihood for farmers in Awi Zone highlands, but soil acidity and land degradation have hindered its growth (Afework et al., 2023b; Nigussie et al., 2021; Tamirat & Wondimu, 2019). To address this, farmers have implemented strategies like area closure, terracing, check dams, soil bunds, and tree-based agroforestry, specifically *Acacia decurrens*. The conversion of cropland into *Acacia* plantations has gained attention and expanded extensively overtime because of its environmental, economic, and social benefits (Afework et al., 2023b; Chanie & Abewa, 2021; Wondie & Mekuria, 2018). The ABA in the Awi highlands is a cyclical agroforestry system with crops in agricultural fields, following a rotation of 4-5 years (Afework et al., 2023b). Agroforestry practices like ABA reduce rural poverty and food insecurity by providing cash income, employment, fodder, fuel wood, and other ecosystem services (Afework et al., 2023ab; Chanie & Abewa, 2021; Nigussie et al., 2021; Tamirat & Wondimu, 2019).

According to the Agriculture Office of Awi Administrative Zone (2021), Fagita Lekoma, Banja, and Ankesha Guagusa districts have been facing food insecurity with varying degrees of vulnerability. Many households in these districts are beneficiaries of the Safety Net Program (SNP). For example, in Banja, 14 out of 18 rural kebeles were aided by the SNP, with 5487 households (3581 male and 1906 female) being beneficiaries. However, the expansion of ABA in the area has brought promising socioeconomic changes. Given the challenges of a growing population, high levels of land degradation and food insecurity, and a changing climate, ABA practices is of paramount importance in mitigating these challenges and reducing the associated risks, including crop production failure.

Past scientific studies have overlooked the contributions of small-scale tree-based agroforestry, such as *Acacia*, to rural food security. However, some studies have examined various aspects of *Acacia* tree plantations, including their spatial dynamics and livelihood benefits (Afework et al., 2023ab; Chanie & Abewa, 2021; Nigussie et al., 2021; Wondie & Mekuria, 2018). Existing

scientific inquiries on *Acacia* have not addressed the food security implications of ABA practices on farm-households. To our knowledge, there is no published study on this topic in Ethiopia or elsewhere.

Therefore, this study aimed to address the following research objectives: 1) To analyze the food security status of households using ABA system compared to non-users, and 2) To examine the factors determining the food security of farmers in the study area.

Methododology

Description of the study area

The study was conducted in Awi Zone highlands, Amhara National Regional State of Ethiopia, specifically in *Ankesha-Guagusa*, *Banja*, and *Fagita Lekoma* districts. It covers an area of 1,666.24 square kilometers, located between 10°43′00″-11°10′00″ North and 36°40′00″-37°10′00″ East. The area has two agro-climatic zones: temperate (*dega*) and sub-tropical (*woina dega*), with elevations ranging from 1,799 to 2,968 meters above sea level (Figure 1). The average annual temperature ranges from 10 to 25°C, with a total annual rainfall exceeding 1800 mm (https://climexp.knmi.nl/get_index.cgi, accessed on 23 May 2022). Mixed agriculture and tree plantations are the main sources of livelihood for the population. Major crops cultivated in the area include potato, wheat, barley, and teff (Afework et al., 2023b; Nigussie et al., 2021). Farmland, forests, grazing land, bushland, and settlements are the major land use/cover types in the study area (Afework et al., 2023a).

Research design and approach

This study employed a sequential explanatory mixed design, combining quantitative and qualitative approaches. The data collection process began with the collection of quantitative data through a questionnaire, which was analyzed using descriptive and inferential statistics. Afterwards, key informant interviews and focus group discussions were conducted with concerned stakeholders, including ABA-users and non-users, to obtain supportive data. Finally, the study integrated the quantitative and qualitative findings to gain a comprehensive understanding of the issue and achieve the stated objectives.

Sample size and Sampling procedures

This study used a multi-stage sampling method to select study districts, sample kebeles, and household heads. Three districts, namely Ankesha-Guagusa, Banja, and Fagita Lekoma (FL), were first purposefully chosen due to high degree of Acacia expansion and its wider coverage. Secondly, nine sample kebeles[3] (*Ankesha-Guagusa*: 2, *Banja*: 3, and *FL*: 4) were also purposefully selected based on their Acacia plantation establishment experiences, accessibility, and plantation cover. The farm-households were then divided into two groups, ABA-users and non-users, to investigate the impact of ABA on rural food security.

From the total 7,170 household heads in the target kebeles, 6,061 (84.5%) were ABA users, and the remaining 1,109 (15.5%) were non-users. Sample size determination in scientific studies depends on population heterogeneity, available resources, and desired accuracy factors, however, documented evidence recommends 5-10% samples from a population (Cochran, 1977; Anderson & Williams, 2017). Thus, considering factors like heterogeneity and resources, a sample size of 441 households (319 growers and 122 non-users) was initially chosen. However, 8 questionnaires were not returned and 17 were not correctly filled, resulting in a final sample of 416 (296 users and 120 non-users).

[3] *Small administrative units in Ethiopia*

Both primary and secondary data collected from various sources were used in this study. The primary data sources consisted of sample respondents, government officials, development agents, and food security experts in the area. The secondary data were also collected from various sources, including journal articles, books, policy papers, government reports, and documents/guidelines from WFP and FANTA.

Standardized questionnaires on the Months of Adequate Household Food Provisioning (MAHFP), Household Dietary Diversity Score (HDDS), Food Consumption Score (FCS), Household Food Insecurity Access Scale (HFIAS), and Reduced Coping Strategies Index (rCSI) were used to collect data on food security conditions, while a non-standardized questionnaire was employed to gather background data about participants. The questionnaire was evaluated by experts, translated into *Amharic*, and piloted among local farmers. Feedback from professionals and the pilot was incorporated into the final English version, which was translated back into *Amharic* and distributed to sample households. Qualitative data was also collected through KIIs and FGDs. KIIs involved local elders, officials, and experts on the issues, while FGDs were conducted with ABA-users and non-user's farmers.

Food security measurement techniques and procedures

Food security is a complex concept that includes availability, access, utilization, and stability of food. Measuring food security is challenging because there is no single indicator. Experts suggest using a combination of measures to assess all aspects comprehensively (FAO, 2013b; Ike et al., 2017; Mccordic et al., 2023). In this study, we used multiple indicators (MAHFP, HFIAS, HDDS, FCS, and rCSI) to obtain a comprehensive result.

MAHFP: assesses household food availability over the past year (Mccordic et al., 2023). Participants were asked to indicate the number of months they experienced insufficient food. Based on their responses, they were grouped into food insecure (not, low, and moderate adequate food provisioning) or food secure (very adequate food provisioning) (table 1).

HDDS: measures a household's food accessibility based on 12 food groups (cereals, roots and tubers, vegetables, fruits, meat, eggs, fish, pulses/legumes, milk/dairy, oil/fats, sugar/honey, and others such as coffee and tea) consumed in the last 24 hours (Deléglise et al., 2022). Participants reported daily consumption status of the 12 food groups, and the score calculated by summing "yes" responses. Lastly, households classified into low, medium, and high diet diversity based on FAO guidelines (table 1).

FCS: a weighted measure of household food security, considering food diversity, consumption frequency, and nutritional value. It involves grouping food items, assigning weights, multiplying by consumption frequency, and summing the values (WFP, 2008; WFP, 2016). Respondents of the study were asked about their food group consumption frequency 7 days prior to the survey. The FCS was then calculated using assigned weights for different food groups: vegetables (1), fruits (1), meat and fish (4), pulses (3), cereals and tubers (2), milk (4), sugar (0.5), and oil (0.5), based on the collected data and above-mentioned procedures (WFP, 2008, WFP, 2016). Finally, households grouped into poor, borderline, and acceptable consumptions based on WFP recommendation (table 1).

HFIAS*:* assesses food inadequacy and psychological stresses in households. It consists of nine questions measuring behavioral and psychological impacts of food insecurity (Coates et al., 2007). Respondents were asked if they experienced any of nine food insecurity-related conditions in the past month, and the frequency of occurrence was recorded. Based on the computed score, households were classified as food secure or insecure using predefined standards (table 1).

RCSI: measures individuals' actions in situations of food insufficient. It uses standardized coping behaviors with severity weights. The five main coping strategies include consuming less-expensive foods, obtaining food or money from friends/relatives, limiting meal sizes, cutting adult intake, and decreasing meal frequency with a weight of 1, 2, 1, 3, and 1 respectively (REAL, 2022; WFP, 2016). The rCSI score is calculated by multiplying the frequency of coping strategies by their severity. Lastly, households were classified into different levels of food insecurity using standards presented in table 1.

The study used a comprehensive measure of food security, composite FSI to account for the variation in indicators. The composite FSI was developed by normalizing the scores of the MAHFP, HDDS, FCS, HFIAS, and rCSI indicators (Mutea et al., 2019). Min-max normalization was used to convert each score to a scale of zero to one (Mccordic et al., 2023):

$Xi = (Ri - Vmin)/(Vmax - Vmin)$…….. (1)

Where X_i = normalized score for the n^{th} household; R_i = row score to be normalized; and V_{min} and V_{max} = minimum and maximum scores of the indicators.

Since higher scores in rCSI and HFIAS scales indicate less food security, the Min-Max Normalization technique was modified by reversing the direction of the scales (Mccordic et al., 2023):

Xi = (Ri - Vmax)/ (Vmin - Vmax) ……. …….. (2)

Lastly, the composite FSI was calculated by adding the normalized scores of the above five indicators and dividing the result by five. The FSI ranges from 0 to 1, with higher values indicating better food security. A FSI between 0.5 and 1.00 classifies households as 'food secure', while a FSI below 0.5 categorizes households as 'food insecure' (Mutea et al., 2019).

Data analyses techniques

A combination of quantitative and qualitative data analysis techniques was used in this study. Among the quantitative data analysis methods, descriptive statistical tools, like percentages, means, range, and standard deviations, were used to analyze the food security conditions of surveyed households. Inferential statistics, such as an independent sample t-test was used to compare the mean differences in various food security measures (MAHFP, HDDS, FCS, rCSI, HFIAS, and FSI) between *ABA-users* and non-users. Moreover, binary logistic regression was used to determine the factors influencing food security by examining the relationship between a dummy dependent variable (food secure: food insecure) and various explanatory variables, including age, sex, marital status, family size, education, land size, livestock holding, off-farm and non-farm activities, tree plantations, irrigation access, credit access, extension services, trainings, and market distance. The logit model written below was applied in the study (Ae, 2013):

$Z_i = B_0 + B_1X_1 + B_2X_2 + \ldots\ldots + B_nX_n + u_i$, ……. …..……. (3)

Where: Z_i is the function of a vector of n^{th} explanatory variables, $X_i's$ are the explanatory variables, $B_0\, is$ the intercept, $B_i's$ are the regression coefficients of predictor variables, and u_i stochastic error term.

Table 1: Summary of food security indicators' measurement, purposes, and classification thresholds

Indicators	Measurement method	Dimension Covered	Time reference	Scored Values	Classification guidelines	Source
MAHFP	Twelve months minus the number of months that a household unable to meet food needs in a year	Availability	12 months	0-12	0-3 months: not AFP 4-6 months: low AFP 7-9 months: Moderate AFP 10-12 months: Very AFP	(Berihun & Ejigu, 2018; Swindale & Bilinsky, 2010)
HDDS	The total number of different food groups consumed by a household on the previous day	Access and utilization	24 hours	0-12	≤ 3: low 4-5: moderate ≥ 6: high	(FAO, 2013b; Mccordic et al., 2023)
FCS	The frequency of consuming diverse standardized foods multiplied by the food's nutritional value in the past week	Access and utilization	7 days	0-112	< 21: Poor 21-35: Borderline > 35: Acceptable	(WFP, 2008; WFP, 2016)
HFIAS	The occurrence of 9 generic questions on food quality/quantity and anxiety, multiplied by their frequency in the month before the survey	Access and stability	1 month	0-27	0-1: FS 2-8: Mild FIS 9-16: Moderate FIS ≥17: Severe FIS	(Dekker et al., 2018; Mccordic et al., 2023)
rCSI	The severity (weight) of coping strategies used by households 7 days preceding the survey, multiplied by frequency.	Access and stability	7 days	0-56	0-3: FS 4-8: mildly FIS 9-18: Moderate FIS > 18: severe FIS	(Maxwell et al., 2014; Ike et al., 2017)

AFP= adequate food provisioning, FS= food secure, FIS= food insecur

Results

Overview of ABA System in the study area

In the study area, the practice of acacia plantation involves various land use practices that span from the initial planting phase to the eventual harvesting. ABA-user farmers in the area make efficient use of their land by implementing Acacia-crops, particularly teff or wheat intercropping, during the first year of the plantation. As the plantations grows, typically 2-3 years, farmers utilize the acacia-planted land as a valuable source of grass for their livestock, employing the cut and carry practice. As the plantations reach three years and beyond, the trees' canopy covers the ground surface, restricting the feasibility of other land uses within the plantation fields (Fig. 2). This indicates that acacia plantations serve as sustainable land use systems that offer diverse socioeconomic and environmental benefits to the local communities.

Fig 2. Cyclical Acacia cultivation processes from planting to harvesting

Food security status of households using different indicators

The study found that most households (40.6%) had moderate dietary diversity, while 35.8% had high diversity and 23.6% had low diversity. Specifically, ABA users had better diet diversity than non-users, with 37.2% of users exhibiting high diversity compared to 32.5% of non-users. The t-test showed a significant difference in diet diversity scores between ABA users (M=6.05) and non-users (M=5.38); t (418) =4.59, p=0.008 (Table 2). This highlights the positive impact of ABA on improving diet diversity, despite overall dietary intake not being in good status. Regarding consumption frequency, cereals, root crops, and legumes were commonly consumed, while vegetables, fruits, meat, and eggs were consumed less frequently.

The FCS results showed that most households (46.4%) had borderline food consumption scores. Acceptable and poor consumption scores accounted for one-third and one-fifth of the sample population, respectively. ABA users had the highest proportion in the acceptable consumption score category, while non-users were more prevalent in the borderline and poor categories. The mean comparison also revealed a significant difference in FCS between users and non-users, t (418) =2.40, p=0.043. Overall, 67.1% of households fell into the borderline and poor consumption groups.

According to MAHFP, over half of households had high food security, with enough food for 10 to 12 months. The second largest group had moderate food security (30.8%), ensuring adequate food for 7 to 9 months. The third-ranked group experienced food insecurity (15.8%), with 4 to 6 months of sufficient food. Severe food insecurity was rare, accounting for only 2.9% of households. ABA users had a better food provision status (53%) compared to non-users (45%). However, statistical analysis showed no significant difference in MAHFP between the two groups, despite the relatively better food provision status of ABA users.

Moreover, the survey results revealed that food provision inadequacy in the study area followed a seasonal and cyclical pattern. Households experienced severe food shortages during the summer and early spring seasons. These shortages were not only due to limited annual production capacity but also poor agricultural produce management and wasteful ceremonial culture. FGD participants described this situation as follows:

"In our area, food availability is a pressing issue, especially from June to September due to many factors, including mismanagement of own produce. The community's lavish ceremonial culture, comprising weddings, teskar[4], mahber, and other events, leads to excessive spending. Farmers often sell their agricultural produce and assets to fund expensive celebrations, leading to food shortages. This recurring issue calls for effective measures from stakeholders."

Key informants also reported that households hosting weddings and/or *teskar* events mostly experience food shortages, particularly on the eve and beginning of the Ethiopian New Year.

Figure 3 shows that over half of surveyed households experienced anxiety /uncertainty about food availability, 30 days before the survey. Relatively, non-user households (55.8%) experienced more worry about getting enough than ABA-users (49.7%). Among ABA users, 79.1%, 82.3%, 41.5%, and 13.5% were unable to eat preferred foods, had limited food varieties, consumed undesired foods, and reduced meal frequency, respectively. Non-users also faced similar challenges, with percentage shares of 86.7%, 91.7%, 50.8%, and 15%, respectively. The incidence of more severe challenges, like meal size reduction, complete food absence, skipping dinner, and not eating for a whole day, was relatively low for both groups (Figure 3). The findings generally indicate that both ABA users and non-users encountered food access and stability challenges, with non-users experiencing greater difficulties on the HFIAS parameters.

The aggregated HFIAS analysis revealed that most households (41.2% users, and 46.7% non-users) had moderate food security. The second-ranked groups (51% users, 37.5% non-users) were foods secure, and only 10% of households were severely food insecure. The figures indicate that ABA users were dominant in the food-secure groups, while non-users were primarily concentrated in the food-insecure categories (Table 2). The statistical analysis further indicated a significant mean difference between the two groups in HFIAS scores ($t(418) = -3.38$, $p=0.001$). This discloses the significant benefits of ABA in enhancing the welfare of participating farmers by reducing vulnerability to food insecurity.

[4] *A burial ceremony celebrated 40 days after death by Orthodox Christian followers*

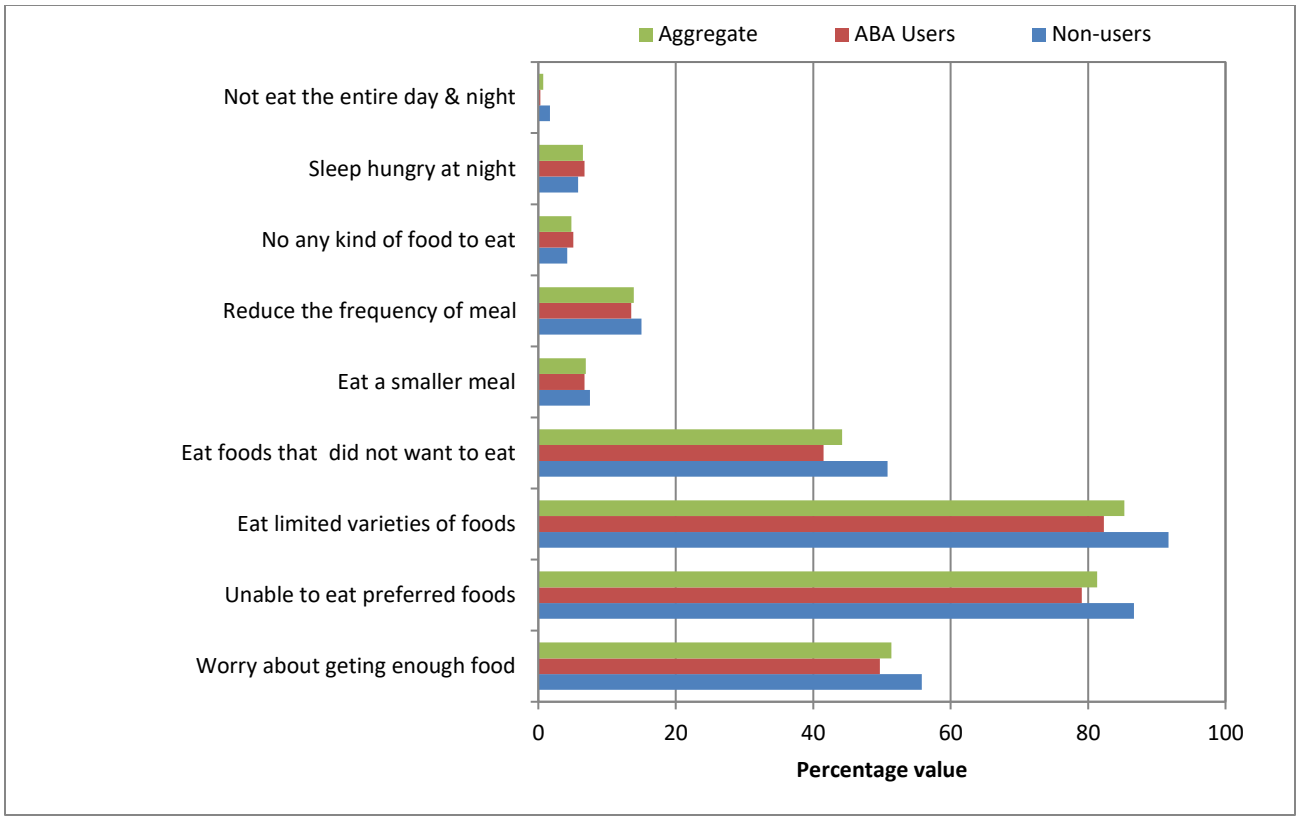

Fig. 4 Distribution of households by their response to HFIAS questions

Regarding rCSI, approximately 68.4% of households were food secure, with 45.4% classified as mildly food secure and 23% as highly food secure. The remaining 31.6% were food insecure (23.8% moderately, 7.8% severely). In the mild food insecure and food secure groups, ABA users were 7.5% higher than non-users However, in the moderate and severe food insecure group, non-user households exceeded by 15.5% (Table 2). The t-test also showed a significant mean difference between ABA users and non-users. Food-insecure households coped by consuming less-expensive foods, borrowing food or money from friends/relatives, and reducing meal frequency. Decreasing meal sizes and adult intake were less commonly used strategies in the area.

Table 2 shows that different food (in)security indicators classified households into various groups. Specifically, HDDS, FCS, and rCSI indicate lower food security status than MAHFP and HFIAS due to varying cutoff points and assessment questions. To address this variation, a composite FSI was calculated. The FSI revealed that 42.3% of households were food secure, while the majority (57.7%) were food insecure. Among ABA users, 44.9% were food secure, compared to 35.8% of non-users. The mean comparison analysis indicated that users had a significantly higher mean FSI than non-users. This indicates the promising benefits of Acacia cultivation in improving food security for rural ho

The qualitative analysis also confirmed the positive impact of ABA on household food security.

Indicators	Classifications	Percentage share			T	p-value
		Growers	Non-growers	Total		
HDDS	High	37.2	32.5	35.8	5.08	0.008
	Moderate	41.6	38.3	40.6		
	Low	21.2	29.2	23.6		
FCS	Acceptable	35.4	26.7	32.9	2.40	.043
	Borderline	45.3	49.2	46.4		
	Poor	19.3	24.2	20.7		
MAHFP	Very AFP	53	45	50.7	1.07	.282
	Moderate AFP	31.2	30	30.8		
	Low AFP	13.8	20	15.6		
	Not AFP	2	5	2.9		
HFIAS	FS	16.9	11.5	14.2	-3.38	.001
	Mildly FS	34.1	26	30		
	Moderately FIS	41.2	46.7	43.9		
	Severely FIS	7.8	15.8	11.8		
rCSI	FS	25.4	17.5	23	-3.68	.000
	Mildly FS	47.6	40	45.4		
	Moderately FIS	20.6	31.7	23.8		
	Severely FIS	6.4	10.8	7.8		
FSI	Food secure	44.9	35.8	42.3	2.68	.071

Key informants reported that ABA helps to generate income, enabling them to buy and consume a wider range of nutritious food. An elderly informant from *Endewuha Kebele* shared his experiences as follows:

"*I had seven 'qada[5]' less productive lands and supported nine family members. using a high amount of artificial fertilizer, the output couldn't cover our expenses before Acacia cultivation. During that time, providing enough food for my family was unthinkable. We struggled to afford basic food items, especially from June to September. To cope, we ate less preferred foods, worked for daily wages, and borrowed food/money. Repaying debts consumed most of our winter harvest, creating a cyclical food insecurity. However, engaging in Acacia cultivation improved our income and soil fertility, changing our food insecurity situation. Now, I grow crops alongside Acacia trees, which brings favorable socioeconomic benefits, but market inflation and high production costs poses challenges to the benefits of tree plantations."*

Table 2: Food (in)security Status of ABA user and non-user households in the study area

Determinants of food security in the study area

A logistic regression analysis was conducted to assess the impact of various variables on households' food security. The results revealed a highly significant regression model (X2=199.552; df=17; p<0.001) with no multicollinearity (VIF below 10). The model accounted for 50.9% (Nagelkerke R2) of the variance in food security and accurately classified 80% of cases. Among the 15 variables analyzed, 9 significantly influenced households' food security (table 3).

The age of household heads has a significant negative impact on their food security (-0.035, p<0.05). Specifically, a unit increase in the age of household heads decreases the probability of being food secure by 96.5%. This implies that younger household heads are more likely to be food secure ***of food security in the study area***

[5] *A local land measurement unit equal to 0.25 hectares*

A logistic regression analysis was conducted to assess the impact of various variables on households' food security. The results revealed a highly significant regression model (X^2=199.552; df=17; p<0.001) with no multicollinearity (VIF below 10). The model accounted for 50.9% (Nagelkerke R2) of the variance in food security and accurately classified 80% of cases. Among the 15 variables analyzed, 9 significantly influenced households' food security (table 3).

The age of household heads has a significant negative impact on their food security (-0.035, p<0.05). Specifically, a unit increase in the age of household heads decreases the probability of being food secure by 96.5%. This implies that younger household heads are more likely to be food secure compared to elders, possibly due to declining physical and mental abilities with age. The study found a significant negative relationship between family size and food security (β = -0.183, p = 0.013). The odds ratio indicated that larger families have lower food security (0.83 factor) compared to smaller families. This is attributed to the presence of large dependent family members, particularly those under 15 in the study area.

The study revealed a significant negative association between credit access and food security (B= -0.993, p= 0.000). Specifically, households with credit access had a 0.37 times lower probability of being food secure compared to those without. This study also found that landholding size had a significant positive effect on food security, with a coefficient of 0.351, p<0.01. Moreover, increasing farmland by one unit led to a 1.42 times higher probability of achieving food security, thus larger landholding size correlated with higher food security and vice-versa.

According to table 3 participating in off-farm activities had a significant positive impact on food security (B=0.684, p=0.015). Households with access to off-farm activities were 1.98 times more likely to achieve food security. The survey results further revealed that owning livestock assets positively and significantly impacts food security (0.034 coefficient), at a 5% significance level. The odds ratio shows that increasing livestock possession by one TLU raises the likelihood of food security by 1.04 times. This indicates that households with more livestock have better food security than those with smaller livestock.

Market distance affects transportation costs for buying/selling goods. The empirical analysis revealed a negative relationship between market distance and food security status (coefficient: 0.010, odds ratio: 0.990, p=0.016). The probability of food security decreases by 0.99 times with increasing market distance. Access to irrigation significantly and positively affects households' food security (B=.944, p=.001), with a 257.1% increase in the probability of food security.

Households' tree plantation experiences positively impact their food security status, with a coefficient of 0.172 (P<0.01). The results further show that experiences in tree plantation increase the likelihood of achieving food security by 118.8%. FGD participants underlined that tree planting in agricultural fields and communal lands, along with charcoal production, generates significant income, and employment opportunities.

Table 3: Binary logistic regression results on the determinants of food security status

Variables	Coefficient (B)	Standard Error (SE)	Wald	P-value	Odds Ratio Exp(B)	95% C.I EXP(B)	
						Lower	Upper
Age	-.035	.016	4.793	.029	.965	.935	.996
Sex	.337	.384	.772	.380	1.401	.660	2.975
Marital status	.310	.450	.475	.491	1.364	.564	3.297
Educational status	.036	.290	.016	.901	1.037	.588	1.830
Family size	-.183	.074	6.131	.013	.833	.721	.963
Livestock holding	.034	.017	3.970	.046	1.035	1.001	1.070
Farmland size	.351	.062	32.483	.000	1.421	1.259	1.603
Credit service	-.993	.279	12.696	.000	.371	.215	.640
Off-farm	.684	.282	5.877	.015	1.982	1.140	3.446
Non-farm	.205	.417	.241	.624	1.227	.542	2.779
Irrigation	.944	.285	11.001	.001	2.571	1.472	4.493
PE	.172	.042	16.823	.000	1.188	1.094	1.290
Training	.333	.272	1.495	.221	1.395	.818	2.378
Extension service	-.375	.403	.868	.352	.687	.312	1.513
Market distance	-.010	.004	5.769	.016	.990	.982	.998
Constant	-3.063	1.144	7.172	.007	.047		
N	427	Prob > chi^2		.000	Cox & Snell R^2		0.378
LR $chi^2(17)$	199.552	-2 Log likelihood		371.663	Nagelkerke R^2		.509

*, ** significant at 1, and 5 % probability level, respectively, PE=Plantation experiences

Conclusion and Recommendations

The study examined the food security of ABA user and non-user households using a multi-dimensional approach. The composite FSI showed that more than half of the total households were food insecure. Comparatively, ABA-user households had higher food security levels than non-users across all food (in)security indicators. From this, it can be inferred that ABA positively influences the food security conditions of farm-households by reducing their vulnerability shocks/stresses. Regarding the determinants of food security, it was found that livestock holding, farmland size, participation in off-farm activities, irrigation access, tree plantations, and perceived soil quality have a positive impact on food security. Conversely, age, family size, credit access, and market distance negatively impact food security.

Based on the study's findings, the following recommendations are suggested: (1) Awareness campaigns and intervention measures should be implemented to address extravagant socio-cultural ceremonial practices; (2) The Safety Net Programs creates dependency among users, thus other strategies focusing on human capital development and creativity should be implemented; (3) ABA systems improve land quality, increase farmers' income, and combat food insecurity. Therefore, stakeholder support through training, finance, and modernization is vital for promoting and maximizing these benefits.

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5.CROSS-CUTTING ISSUES

5.1. Cultural entrepreneurship and cultural resonance in the case of artificial cultural hair braids in Addis Ababa

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Abstract

This study assesses cultural entrepreneurship and resonance in Ethiopian cultural hair braids, focusing on audience opinions, entrepreneurial values, CE's role in producing ACHBDs, and CR presence in the ACHBD. Only primary data collected via questionnaire (1,249) and interviews (7) with customers of beauty salons were used for this study. Findings indicated that Audiences have moderate level of understanding regarding the cultural values of OCHBDs and they feel highly proud of their Ethiopian identity. The Entrepreneurial values that added to the OCHBDs are diversity in braid designs and sizes, separate existence from the human skull, color and availability in cosmetics markets. On top of that, their price is fair given the relatively longer period they could serve the buyer. The main reason of CEs in reproducing the ACHBDs is their motive to get more income. Nonetheless, CEs have overlooked the need to create cultural resonance in the ACHBDs. Cultural Entrepreneurship that violates the agreed up on cultural standards might offend the Audiences and make the CEs effort useless. Therefore, the CHBs need to equip themselves with skills and techniques that enable them to come up with culturally resonant products and get more income from them.

Key words: *artificial cultural hair braids, cultural entrepreneurship, cultural resonance, cultural hair braids, cultural entrepreneurs, entrepreneurial values*

Introduction

Entrepreneurship, originating from the French word 'entreprendre', refers to the process of taking risks to establish a new business with the aim of gaining profits. It has been a part of human civilization since the age of knowledge. Thus, Entrepreneurs are business innovators who seize opportunities, translate them into marketable ideas, and take risks to establish new businesses with the aim of gaining profits (Covey, 2004; Frederick, O'Connor & Kuratko, 2016).

Culture is one of the most complex concepts in social science (Eagleton, 2000). Its complexity rendered proliferation of various definitions. Culture refers to the shared ideas, values, and beliefs within a society that influence how individuals interpret experiences and generate behaviors (Haviland, 1999). According to Schein (2004), culture is a group's established assumptions developed to cope with external adaptation and internal integration issues and are taught to new members as a new way of perceiving, thinking, and feeling. Hence, cultural assumptions, values, and belief systems dictate surface-level artifact patterns like greeting, dressing, design, addressing, office layouts, organizational structures, beauty standards, music, and dancing.

Culture, a unique identity, is debated for its sacredness and consistency (Tomasello, 2016), as it evolves based on internal and external influences, necessitating gradual adjustments to its philosophies and values (Schein, 2004; Heyd, 2003). Similarly, Haviland (1999) explained that culture is shared, learned, symbolic, integrated, and adaptable, requiring successful problem-solving to survive. It responds to environmental changes and evolves accordingly. Cultural entrepreneurs serve as a bridge between the world of art and the world of economy (Toghraee & Monjez, 2017).

Cultural entrepreneurs often identify opportunities and transform them into valuable products or services (Druker, 1985), which can sometimes conflict with cultural norms, as audiences may not be willing to purchase or use such innovations due to their lack of acceptable cultural resonance. That is why; most entrepreneurs often adhere to societal values, by slightly transforming them into practical artifacts (Soublière & Lockwood, 2022). This scenario is viewed by some writers as an iron cage for innovation and creativity (Lounsbury, Cornelissen, Granqvist & Grodal, 2019; Aldrich & Martinez, 2015, Brown & Ulijn, 2004).

Cultural resonance (CR) in social anthropology aims to reconcile culture and innovation, with two main approaches based on scholastic debate on whether culture is static or adaptable (Haviland, 1999). The first one states that culture is a static and sacred concept, and Cultural Entrepreneurs (CEs) can create culturally resonant innovations only if they are competent in understanding and adhering to cultural standards (Shrum, 2001, Hansen & Birkinshaw, 2019), while the second approach emphasizes on the adaptable nature of culture, requiring CEs to test their new cultural product's features, create new ones, and educate the community about their cultural significance. By so doing, CEs make cultures change through time (Soublière & Lockwood, 2020, Schein, 2004, Druker, 1985).

Cultural hair braiding is an Indigenous art form that shows the creativity and innovation of the braider while maintaining the fundamentals of the original design. Hair styles in Ethiopia, practiced since ancient times, serve as non-verbal communication tools, expressing sex, age, ethnicity, social status, normality, joy, and sadness (Tadesse, 2015). These days, cultural hair braids are being artificially produced by hair braiders, displayed in cosmetic shops, and dressed by some residents of Addis Ababa during public and private celebrations. However, as far as the researchers' literature search is concerned, there are no studies done, in Ethiopia, focusing on cultural resonance and innovation of artificial cultural hair braids.

Thus, the purpose of this study is to identify whether innovation of the artificial cultural hairbands (ACHBDs) was done with full understanding of cultural meanings and using the strategies of transcending them by enriching the Audience's and the CEs' cultural repertoires.

The main objective of this study was to identify cultural competence of hair braiders to come up with culturally resonant ACHBDs and get the anticipated profit. Specifically, this study was intended to:

1. Assess the perception of Audiences on the original cultural hair braids and the artificial cultural hair braids.
2. Identify the entrepreneurial values added to the original cultural hair braids.
3. Find out the HBDs rational in producing the original cultural hair braids.
4. Scrutinize presence of cultural resonance in the artificial cultural hair braids.

Literature Review

The concepts of culture and entrepreneurship

Culture is one of the most complex concepts in social science (Eagleton, 2000). For instance, the first attempt to define the concept holistically was made by Tylor 1871, cited in Haviland (1999, p. 36). According to this writer "culture *is the complex whole that includes knowledge, belief, art, law, morals, custom and any other capabilities and habits acquired by man as a member of society.*" However, recently developed definitions of culture distinguished between the actual habit and the underlying beliefs and directed their definition of culture to philosophical assumptions, values and beliefs that drive certain habit (s) in society.

Schien (2004) defines culture as a shared set of meanings, philosophies, values, and norms within a group; while Hofsted (2011) conceptualized it as defining the collective mind programming that distinguishes members from others. Culture is viewed as the accumulation of generative potentials that determine the range and features of cultural products that are possible and viable within a specific cultural landscape (Lounsbury & Glynn, 2019).

Aageson (2008) cited in Toghraee and Monjezi (2017, p.70) defined CEs as risk-takers, change agents, and creative thinkers who generate income from sustainable cultural activities, enhance quality of life, and create cultural values for both manufacturers and consumers. Based on these characteristics of culture, societies craft their own functional and symbolic products that they wish to transcend among generations (Silverman, 1999). On the other side, CEs toil to produce new features of cultural artifacts that they believe is modern, convenient, and enhanced (Lounsbury, Cornelissen, Granqvist & Groda, 2019).

Nonetheless, CEs could rally support if and only if their products resonate with their targeted Audience's expectations. CEs must balance contradicting interests, such as standardization and creativity, old-timers and newcomers, novelty and familiarity, and utility and meaning (Peris-Ortiz, Gomez, and López-Sieben, 2019). Cultural creative industries showcase human ability to innovate products based on community knowledge and values, making a product marketable (Peris-Ortiz, Cabrera-Flores & Santoyo, 2019). In fact, the relationship between culture and entrepreneurship can be seen as mutually reinforcing, either positively or negatively (Soublière & Lockwood, 2022).

The challenge of such paradoxes is that cultural values dictate product acceptability, while creativity demands changes. Old-timers preserve symbolic meaning, while newcomers enjoy changes. Entrepreneurs display creativity, but culture members relate it to community familiarity. CEs must be culturally competent to effectively combine meaning and functionality in their products through challenging work in both thinking and action (Soublière & Lockwood, 2022).

The Concept of Cultural Resonance

Cultural resonance refers to the alignment between the message of cultural innovations and the standardized perception of cultural acceptability by audiences (McDonnell, Bail & Tavory, 2017, Shrum, 2001). Cultural resonance is primarily believed to occur when cultural objects are linked to the audience's social circumstances or broader cultural themes and narratives they recognize (Susen, 2019).

Soublière and Lockwood (2022) suggest that cultural challengers can balance their innovations with audience expectations, as the fit between a message and audience's expectations changes over time. Therefore, resonance emerges in the relations among object, person, and situation (Susen, 2019). It is also stated that cultural objects are not relevant unless they are employed to solve a certain social problem (Druker, 1985). CR requires initial congruence between the cultural object

and actors' ways of seeing the world. Resonance is strongest when the object's solution is neither too familiar nor too resistant to interpretation or extension, not just alignment itself (Susen, 2019, Druker, 1985).

The link between cultural entrepreneurship and cultural resonance

Whenever a societal problem happens, entrepreneurs must choose solutions that align with societal values and habits, ensuring continuity of human tendency through habits and heuristics (Lounsbury, Cornelissen, Granqvist & Groda, 2019). However, the 21st century's intricate societal landscape offers opportunities for skilled entrepreneurs to harness their creativity and autonomy (Soublière & Lockwood, 2022; Druker, 1985). Entrepreneurs target diverse audiences with unique interests and worldviews to create innovative products and services, aiming to add value and influence positive societal thinking (Soublière & Lockwood, 2022; Aldrich & Martinez, 2015).

Cultural entrepreneurs leverage wisdom, social capital, and cultural knowledge to improve society and economy, creating innovative products using cultural resources, arts, and traditions (Kolb, 2015). Soublière and Lockwood (2022) developed two dimensions of cultural resonance: the extent of interface between CEs and their audiences, and the cultural competence of both actors. They emphasized the need for shared values and the use of cultural elements to evaluate and add to a certain cultural product (CP). Further, these authors designed four strategies of achieving cultural resonance.

Strategy 1: Anchoring: Balancing conformity and differentiation

Cultural entrepreneurs (CEs) can align their products with the audiences' meaning. However, they may intentionally deviate from commonly agreed features to enrich culture. This can occur when CEs are novice or lack cultural competence. Cultural reproducers align their products with pre-existing cultural criteria to maintain conformity with audience meaning. They must prove their new product adds value to known features by comparing technological and economic superiority to common methods.

On the other hand, cultural challengers aim to deviate from conventional production methods, focusing on their unique features, technological and economic superiority, rather than proving consistency or conformity to existing norms. Cultural challengers' valuation criteria focus on product conformity to technological and economic developments, while maintaining comparability with cultural product standards to avoid audience dismissal (Lounsbury & Glynn, 2019).

Strategy 2: Retooling: Balancing constraint and autonomy

Cultural entrepreneurs face a dilemma between conforming to existing cultural classifications and proving their uniqueness. Emphasizing conformity may miss new features and lose audience approval. Balancing these interests is crucial for CEs to maintain audience approval and create new cultural products. The tension release mechanism depends on the role of cultural reproducers (CEs) and challengers (CEs). Reproducers adapt to audience requirements, sacrificing autonomy, while challengers blend cultural classifications with creative ideas, creating new features of a known cultural product.

However, the release of tension varies based on CEs' position as cultural reproducers or challengers, with reproducers considering audience requirements and internal values as liabilities. Hence, cultural challengers modify trends while renouncing autonomy to meet external requirements, blending cultural classifications with creative ideas to create new features of a known cultural product.

Strategy 3: Channeling: Balancing rigidity and flexibility

Channeling is CEs' effort to understand audiences' meanings, addressing cultural values' rigidity, limiting product attractiveness to wider audiences while supporting specific culture groups. Hence, CEs should ensure flexibility in their products to appeal to multiple audiences, while maintaining rigidity and compatibility with their homogeneous cultural creations' value expectations.

Otherwise, CPs that deviates from audience expectations is considered undesirable and may be overlooked, making it challenging to provide a cultural product to diverse audiences. CEs must cater to diverse audiences by offering a cultural product that conveys multiple meanings that are not necessarily aligned.

Strategy 4: Seeding: Balancing closeness and openness

When the cultural creation reflects different features, CEs must educate and proselytize audiences about the meaning of their new cultural products, balancing closeness and openness. Focusing on sharing common meanings may make the product desirable to a small audience. However, CEs can increase product appeal to wider audiences by incorporating unshared values, but increased polarization and scrutiny may arise, with balancing mechanisms varying by audience type. Homogeneous audiences have a narrow frame of reference, requiring CEs to close new ideas. Heterogeneous audiences value diversity and openly transmit unshared meanings. CEs must provide diverse ways to understand cultural elements for better understanding.

Thus, the main point of Soublière and Lockwood's (2022) study is to aware CEs the importance of cultural competence for CEs to balance audience expectations and entrepreneurial drives, addressing both homogeneous and heterogeneous audiences. In a similar vein, Hansen, and Birkinshaw (2019) suggested that innovations are more successful when managed throughout the value chain, rather than focusing on final product features. They propose three phases for creative products: idea generation, communication, and conversion, which involve overcoming acceptance, unique features, and funding issues to ensure success. Hansen and Birkinshaw's (2019) main point are that CR in final product features requires refined cultural idea from innovative perspectives and effective communication to interested audiences.

Two theories namely the distinctiveness and the social interaction theory dictate how Audiences' decision making on purchase runs out (Rajagopal, 2011). According to these theories, the individual purchaser strives to strike balance between two conflicting interests. On one side, there is a need to get assimilated to a group by adhering to its norms including the dressing code whereas on the other hand the individual has an urge to feel unique and distinct from the group. The social interaction theory also emphasizes the point that hair styling is a mode of aesthetically presenting oneself to a group. But this is highly influenced by prevailing cultural values that guide peer evaluations (Byrd & Tharps, 2014).

Thus, to successfully market their products, entrepreneurs must possess strong interpersonal, communication, and marketing skills to convince audiences of their cultural relevance and superior functional value. Cultural philosophies and values are highly valued in innovative products, challenging CEs to create ACHBDs that exceed cultural standards due to affordability constraints (Chuayounan et. al., 2022; Kolb, 2015). To be successful entrepreneurs, cultural hair braiders need to have rich cultural repertoires and be able to enrich the cultural repertoire of their audiences as well (Soublière & Lockwood, 2022).

Hair styles and modernity in the black world

Hair is a significant aspect of human communities, dating back to the Cro-Magnon period. Hair dressing, influenced by curly and kinky hair, is deeply connected to the way of life of black people worldwide (Byrd & Tharps, 2014). Braiding, a traditional African hair style, involves washing,

drying, combing, stretching, and pulling hair into an artistic pattern, deeply rooted in their cultural heritage. Africans, primarily agrarian, use braiding as a symbolic representation of their traditional land plowing system, comparing land plots to sculls, crops to hair.

According to Greensword (2017), tignons and intricate braiding patterns, dating back to the 1600s, are seen as symbols of femininity, beauty, and social status in sub-Saharan Africa. Lorraine and Suk (2015) emphasize the significance of African women's hair braiding as a cultural expression reflecting holiness, marital status, age, ethnic identity, joy, and sadness. According to Tadesse (2015), black hair braiding offers both functional and stylistic benefits, allowing African women to wear their hair braided while swimming, showering, or in rain without worrying about their style.

African hair braiding styles include dreadlocks, braids, afros, and cornrows. The knowledge and skill of hair braiding, acquired through childhood, is popular in Tanzania, Uganda, and Kenya, where hair braiders create culturally and artistically crafted braids (Lorraine & Suk, 2015). As part of the black world, Ethiopia is rich with varieties of cultural hair styles that represent social status, sex, age, marital status, joy, or sadness (Tadese, 2015; Silverman, 1999).

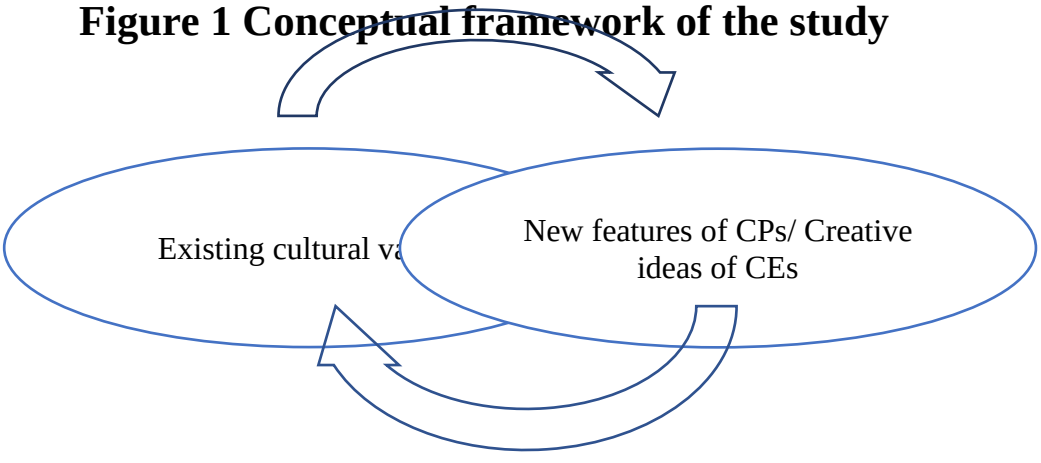
Different studies are conducted on cultural evolution, cultural entrepreneurship (CES) and cultural resonance. According to a study by Tomasello (2016), there is cumulative cultural evolution among human beings. This needs strong conformity and instructs learning. Culture evolves through a ratchet effect, with adults instructing children and the young, and learners reproducing cultural artifacts. Individuals need special cultural learning skills (Soublière & Lockwood, 2022). Toghraee and Monjezi (2017) conducted a study on cultural entrepreneurship in developing countries and asserted that even though cultural industries have enormous potential for development, much attention is not given to them. Besides, these industries face challenges in promotion, branding, distribution, and ownership support due to lack of integration and knowledge of CEs' processes (Hansen & Birkinshaw, 2019).

Conceptual framework of the study

This study's conceptual framework is designed mainly based on Soublière and Lockwood's (2022) proposition that CEs have responsibility to enrich their own as well as those of their Audiences' cultural repertoires.

Enriching the CEs cultural repertoires

Figure 1 Conceptual framework of the study



Source: Developed by the authors based on literature review, (2022).

CEs can do so by applying the strategies of anchoring, retooling, channelling, and seeding. Besides, they also need to take care of viability of their cultural innovations at the stages of idea

generation, production, and diffusion of the products to society (Hansen & Birkinshaw, 2019). Cultural entrepreneurship by its nature is a virtuous circle whereby the relationship between Audiences and CEs is continuous and keeps CR of new innovations by mutual enrichment of cultural repertoires of both audiences and CEs. In such cases the culture in question could get evolved in a healthy manner without getting the audiences offended or letting the efforts of CEs valueless.

Methodology

This study employed a convergent parallel mixed methods approach with descriptive research design which enables the researchers to describe the phenomenon as it is (Creswell, 2009; Gray, 2004). Thus, it was used to describe the perceptions of Audiences and cultural hair braiders (CHBs) regarding production of ACHBs. This study used primary data collected from Audiences, hair braiders, and senior women with detailed knowledge of OCHBDs located in the Bole and Kirkos subcities of Addis Ababa. Accordingly, 700 Audiences, 685 hair braiders and seven key informants were sampled for this study.

Quantitative data were collected using two questionnaires focusing on cultural entrepreneurship and cultural resonance, sentimental attachment of audiences to OCHBs as well as difference between the OCHBs and the ACHBs. Cronbach Alpha results of the questionnaires' reliability test revealed that Audiences' perception about the original hair braids (.808), the entrepreneurial values added to the OCHBD (.827), Rational of CEs to produce the ACHBs (.809), and cultural resonance in the ACHBDs (.780).

The study utilized frequency, percentage, mean, and standard deviation to analyze quantitative data, while qualitative data were analyzed using narrative technique and presented textually. The study utilized a side-by-side comparison analysis method, presenting statistical quantitative results first and then qualitative findings in each thematic area (Creswell, 2009). Results of the quantitative and qualitative data analysis were mixed at the interpretation stage.

Results And Discussion

This study was aimed at addressing four research questions related to cultural entrepreneurship (CES) and cultural resonance (CR) in the case of cultural hair braids in Addis Ababa. 625 (89%) from audiences and 624 (91%) questionnaires from hair braiders were returned and utilized in this study, which implies high levels of response rates that guarantees the researchers to safely proceed to data analysis (Babbie 2008, p. 288).

Most audiences aged 18-42 are first-degree holders, with most married and government employees while Private, self-employed, and students make up 49.0% of the audience. Hair braiding professionals, primarily aged 31-42, are educated, with a majority being secondary and above (55.3%). Most hair braiders are single (42.6%) or divorced (17.6%), with 37.8% being married and having an average of four family members. The descriptive analysis was done using Andrew's (2017) mean and standard deviations standardization rule ($1 \leq Xi \leq 2.5$ as low level; $2.5 < Xi \leq 3.5$ as moderate level, and $3.5 < Xi \leq .5.0$ as elevated level).

Perception of Audiences towards the OCHBDs

Original cultural hair braids (OCHBDs) are artistic knots made on the human skull following a culturally identified pattern, evaluated based on audience knowledge and cultural meanings. Accordingly, the study found that Audiences have moderate level (M=2.98, SD=1.36) of self-identification with OCHBDs and getting their hairs braided for festive events (M=3.13, SD=1.40). However, wearing OCHBDs makes them feel highly proud of their identity (M=3.62, SD=1.43)

and contented with the cultural rhythm it creates (M=4.00, SD=1.24). On top of that, in their responses to the open-ended items of the questionnaire, Audiences stated that:

> The beauty of cultural hair braids lay in their feature that the skull's skin is seen between the partitions of the braids. Further, this enables the hair to get fresh air. However, wearing artificial braids creates heat and discomforts the wearer. Even though the use of ACHBDs saves time and energy of the Audiences, it might discourage creativity overall and the fake nature of ACHBDs affect the wearers' self-esteem as well as pride in their natural appearance.

Therefore, most audiences prefer OCHBDs due to their cultural resonance and creative designs. ACHBDs can last for years, while OCHBDs can be used for a month before needing re-braiding. This practice allows hair braiders to continually transform designs while keeping CR in context.

5.1.1. Entrepreneurial Values Added to the OCHBDs

Cultural values are intrinsic and instrumental, referring to a culture's potential to impact individuals and the economic and social benefits derived from certain philosophies and values (Toghraee & Monjezi, 2017). Intrinsic values are considered as the ends themselves, while instrumental values serve as the means to achieve an end (Hoden, 2006).

Intrinsic values are often given by a culture, and cultural educators (CEs) must add instrumental values to enhance the utility and convenience of culturally specific values. Otherwise, their products could not be considered as innovations (Druker, 1985). In this study, the expected entrepreneurial values were measured based on three dimensions namely: quality, distribution, and price.

Quality

Originally, the term quality refers to accuracy and proficiency of a certain product (Halall, 2020). In this study, eight items were designed to assess the quality features of ACHBDs added by CEs to the OCHBDs.

Data revealed that Audiences moderately (M=3.30, SD=1.41) considered the ACHBDs as fashion hair styles of the day, ACHBDs have better braid quality than the OCHBDs (M=2.43, SD=1.31) which indicates that the OCHBDs have superior quality to the artificial ones, the OCHBDs are more beautiful than the artificial ones (M= 2.73, SD=2.96) and Audiences believed that the ACHBDs could not reflect (M=2.58, SD=1.31) cultural values at equal level with the OCHBDs.

Some of CHBs argued that the ACHBDs, which are braided as a cape on a female mannequin's skull, did not cause skin tightness or irritation compared to direct braiding of natural hair. However, Audiences do not want to get OCHBDs replaced by ACHBDs (M=2.57, SD=1.36) and they believe that ACHBDs do not that much avoid hair breakage (M=2.67, SD=1.42).

ACHBDs can be worn for festive events and removed, extending their lifespan if properly maintained. Audiences' moderate level (M=3.28, SD=1.28) responses indicate that these artificial hair braids can maintain their quality. Moreover, the study indicates that the time-saving feature of artificial braids (ACHBDs) is moderately (M=2.88, SD=1.31) considered a value added to OCHBDs, potentially making them more preferred by audiences.

Regarding the length of time the ACHBDs could be in use without lacking their quality, a hair braider said that:

> ACHBDs are used as occasional outfits for celebrative events, often removed and stored carefully until the next event. In such a manner, ACHBDs can last for extended periods, while OCHBDs, braided on the skull, can last up to a month, but lose quality over time.

On this point, CHBs emphasize that 'the time-saving nature of ACHBDs to balance cultural hair braids with the demands of busy urban life in Addis Ababa'. Another interviewee also explained that:

> ACHBDs are helpful for thin hair as they require surfaced braiding, while thick hair may cause foaming, affecting placement and appearance of the ACHBDs. The replica nature of the ACHBD cape becomes visible and desonates, especially with low-quality wigs. Lower and medium-quality wigs cause sweating, discomfort, and unpleasant odor.

Thus, the moderate responses regarding quality indicate that despite entrepreneurial values in ACHBDs, audiences do not highly believe these products can effectively reflect cultural values within accepted cultural meaning.

Distribution of ACHBs

ACHBDs' innovative quality is enhanced by their separate existence from the human skull, availability in markets and in various colors. The distribution related feature of ACHBDs is measured by size, color, and designs. Concerning distribution, respondents tell us that ACHBDs are available in the market but not at an adequate level of size variety (2.89; SD=1.30), have limited colour varieties (M=2.87, SD=1.21); they are mostly of black and brown colours, and the ACHBDs have moderately (M=3.03, SD=1.27) accommodated braid designs familiar with the original braiding. Therefore, the distribution features of ACHBDs are composed of moderate levels of the required varieties of skull size, colour and designs.

Price of ACHBDs

Hair braiding is a culturally significant occupation, with price variations between OCHBDs and ACHBDs, as per hair braiders' reflections. On this regard, Audiences were asked if the price of both ACHBDs and the OCHBDs is equal. The mean value (M=2.24, SD=1.24) of the response indicate that there is price difference between the OCHBDs and their artificial imitations and ACHBDs is expensive compared to the payment required to get physically braided (M=3.69, SD=1.37).

One of the interviewed hair braiders stated that ACHBDs cost between 2500-3500 birr, depending on wig quality and braiding, while OCHBDs range from 500-1500 birr. ACHBDs are more expensive than OCHBDs, with a price difference of over 100%.

Data reveals that ACHBDs are more expensive than OCHBDs due to the involvement of various actors in the value chain, including producers, suppliers, hair braiders, and sellers. However, Audiences reflected the idea that:

ACHBDs may be useful for busy women with short, thin, and un-braid-able hairs, but
OCHBDs are also suitable. Beauty lies in inner feeling and God's unique standards, and
adding to these standards is not right.

Audiences express dissatisfaction with the availability and number of cultural hair braiders for festive events, as long queues discourage customers from using OCHBDs. The shortage of hair braiders could be a significant factor in increasing the demand for ACHBDs during festive events.

Cultural Resonance in the ACHBDs

Cultural resonance (CR) in the cultural products (CPs) deals with compatibility between features of a product and the cultural values and beliefs underpinning it (Susen, 2019). According to interviewed Audiences, the cultural belief embedded in OCHBDs is that:

> Leaving the hair finely unbraided, even for a single day, attracts sad things to such individual or family's life. Hence, members of the community arrange their time schedule with the hair braider before they get their hair unbraided. However, those

> who wear ACHBDs leave the natural hair unbraided and put the artificial hair braid over it. This act violates the very cultural reason behind braiding the hair.

Soublière and Lockwood (2020) suggest that CEs must replicate cultural values in their innovations, while audiences need cultural competence to identify if a culture-based product aligns with underlying cultural philosophies. The cultural resonance of ACHBDs needs to be assessed from the perspectives of both Audiences and CHBs.

Audiences' understanding about the difference between OCHBDs and ACHBDs is moderate (M=3.58, SD=1.37); which may cause confusion, as they may struggle to identify ACHBDs' incompatible features with societal values, preventing cultural competence to maintain continuity. In terms of cultural quality, the mean value of their response is (M=3.58, SD=1.39) which implies that both OCHBDs and the ACHBDs have cultural quality though original ones have some level of supremacy over their imitations. Similarly, regarding the beauty they give to the wearer, Audiences responded with moderate mean value of (M=3.54, SD=1.37) which implies that both OCHBDs and ACHBDs can culturally beautify the wearer, reflecting a cultural resonance between ACHBDs and societal philosophies, values, and norms.

The study found that original hair braids enhance Ethiopian identity and cultural rhythm better than artificial ones, with a high mean value of (M=3.91, SD=1.29), wearing original hair braids also creates a deeper sense of satisfaction and pride (M=3.90, SD=1.61), and the mean value for feeling missing when wearing artificial hair braids is 3.50, suggesting that despite not reflecting Ethiopian identity and providing equal pride and satisfaction with OCHBDs, there is no significant gap. However, an interviewed Audience stated that "*with all their inconveniences, ACHBDs could reflect Ethiopian cultural appearance, but not the inner feeling of Ethiopian identity*."

Cultural Resonance from the CHBs perspective

Soublière and Lockwood (2020) emphasize that CHBs should prioritize cultural CR, ensuring that CEs enrich their own and their audiences' cultural repertoires using various strategies. The study indicates that ACHBDs partially reflect cultural values (M=3.03, SD=1.33) due to complexity of original designs making them difficult to imitate in high-quality artificial form (M=3.14, SD=1.13). As a result, the ACHBDs moderately disregarded cultural values (M=3.08; SD=1.15), causing distortion in their appearance (M=2.99, SD=1.21). Furthermore, CHBs moderately (M=3.08, SD=1.31) agree that artificial hair braiders are disruptive to cultural identity.

In addition to complexity of the designs of OCHBDs, CHBs were interviewed to explain what makes it difficult for them to make their innovation incorporate all cultural values and ensure CR. In their response, they stated that:

> Even though the two braids seem similar, OCHBDs and ACHBDs are different. In the case of OCHBDs, Audiences and CHBs have physical contact. While braiding the hair, they discuss about different issues including culture. Under such conditions, original hair braiding serves as a social therapy, addressing social issues and tensions, and fostering information sharing, despite the negative impact on self-esteem to those wearing ACHBDs. Male groups are using techniques to humiliate women wearing ACHBDs during celebrations, often using hook-like elements in public transport to pull them off. Such occurrences are discouraging women's and girls from using ACHBDs.

Besides, the CHBs stated that 'synthetic artificial hairs cause discomfort during celebrative events due to heat and sweating, making long-term wear of ACHBDs challenging'. CHBs emphasized the advantages of ACHBDs, including protection from transmittable diseases, simplicity, modernity, and beauty, as well as allowing women to change their look within minutes, despite a

CR gap. Moreover, ACHBDs are exported to the US and Dubai, providing convenience for Ethiopians living abroad. Hair braiding professionals find them especially useful, as they often struggle to find professional cultural hair braiders. Additionally, their availability promotes Ethiopia's beauty.

The rationale behind CEs act of producing ACHBDs

Cultural entrepreneurs (CEs) serve as a bridge between culture and business (Suwala, 2015), requiring visionary, creative, risk-taking qualities and competence to manage the entire value chain, from idea generation to acceptance and usability (Hansen & Birkinshaw, 2019). CEs aim to modernize cultural artifacts by adding value without compromising their basic features. This enhances product acceptance and marketability, making it more appealing to a wide audience. Addition of some new features to a CP will also make it amicable to large number of Audiences. In such scenarios, the CEs' interest to get profit will be secured (Soublière & Lockwood, 2022; Druker, 1985).

The study found that the reasons for producing ACHBDs were initially not aimed at modernizing Ethiopian cultural hair braids (M=2.10, SD=1.11) or to promote the OCHBDs (M=2.43, SD=1.05). In fact, promoting a certain CP requires the CEs genuine and competent effort to add some modern features to the product and make it of utility to generous size of Audiences. Thus, the ability to promote CPs requires CEs to be challengers of the culture instead of its reproducers (Soublière & Lockwood, 2022; Druker, 1985). Rather, the main reason was to get more income but not to modernize and promote the OCHBDs. The focus on income may lead to distorted CP features, making it unattractive to audiences, especially if CHBs lack a comprehensive cultural repertoire on OCHBDs.

Conclusions

The purpose of this study was to assess CR in the ACHBDs which are innovated based on features of OCHBDs. To that end, perceptions of Audiences towards the OCHBDs were assessed, entrepreneurial values added to the OCHBDs were identified, the CHBs rational in reproducing the OCHBDs were determined and the level of CR in the ACHBDs was scrutinized.

Findings indicated that Audiences moderately understand cultural values of OCHBDs and ACHBDs could reflect cultural values in the same level with the OCHBDs. The entrepreneurial values added to the OCHBDs via creation of the ACHBDs were determined as separate existence from Audiences, availability in assorted colours, sizes and designs and price calculated in terms of utility time and quality. The rationale behind CEs endeavor in creating the ACHBDs is related to gaining more income.

Moreover, braiding sessions provide women with fulfillment, acceptance, and happiness, fostering social and personal issues, information sharing, and social therapy among braiders and audiences. In ACHBDs, the audience does not interact with the braider but purchases the product like any other consumer goods. Therefore, creation of ACHBDs may lead to the abolition of personal and societal benefits and using it for many years may also dry up the creativity pool in the area. On top of that, the 'ease-for-use' feature of the ACHBDs does not make it convenient. Because wearing ACHBDs can negatively impact self-esteem and confidence, cause heat and sweating, emit bad smells, discomfort and distracts attention, especially during festive events where many people gather.

CHBs confirmed that they lack detailed knowledge of cultural setting and values, focusing on imitating braids in artifact design for convenience and audience perspective. CEs without cultural knowledge can disrupt target audiences' cultural values and benefits, making them perceived as offenders and potentially neglected by the intended audience, thereby affecting the product's value.

Recommendations

Universities should teach Ethiopian cultural braids and encourage female officials and celebrities to wear OCHBDs during public speeches or performances.

TVET institutions should educate and train more cultural braid professionals to provide accessible and convenient services for women and girls, ensuring their face shape are considered.

The current tendency to use wig (artificial hair) may undermine the Black people's features of beauty and culture. Therefore, the focus should be on preserving and modernizing cultural wisdoms and skills that have been used for generations as functional and beauty standards in society.

CHBs are primarily innovating ACHBDs to increase income compromising the cultural quality of their products. CEs also lack cultural competence to ensure cultural standards. Thus, they must use scientific techniques like anchoring, retooling, channeling, and seeding to enhance their cultural repertoires and those of their audiences. The Ministry of Culture and Sports (MoCS) and stakeholders must conduct detailed anthropological research on Ethiopian cultural hair braids, document and register them under the cultural intellectual property's regime, and train the would-be CEs on strategies of cultural innovation and CR.

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5.2. Research Ethics and Professional Integrity Practice in Ethiopian Higher Education

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Abstract

This manuscript has examined the practices as well as factors affecting research ethics and integrity in Ethiopian higher education, taking ECSU, AAU, and BDU as a case. In doing so, the study used both primary and secondary sources. These sources were cross-checked and triangulated. The study found the following major findings. The overall research, its ethics and integrity in public higher education institutions suffer significant limitations, including Lack of research budget, and inadequate incentive structure; teaching dominant culture in higher education institutions; ineffective Research Ethics Board (REB). The existence of loose monitoring and evaluation system on the key actors— advisors and students. The management of thesis feedback in general, the guidance, documentation, utilization, and monitoring were found to be ineffective. Advisors' commitment is also inhibited by poor incentive mechanism in place. Students lack key set of critical skills, including English language and writing. Finally, the lack of vibrant research culture and practice in sample institutions were found to play an inhibiting role for research ethics and integrity higher education institutions.

Keywords: *Ethics, Integrity, Higher Education*

Introduction

Ethiopia has enjoyed a significant growth in terms of both number and size of universities, the majority of which run graduate degree programs—as a result, several thousands of students have an opportunity to attend graduate programs in several fields of study. For graduate degree programs, the writing and successful defense of a research thesis is a partial requirement to earn a higher degree. This important instrument is introduced, on the one hand, to provide an opportunity for graduate students to exercise and in the process to nurture their research and critical thinking skills. On the other hand, thesis writing also serves as an evaluation tool to measure students' scholarly capacity and therefore based on grading of thesis paper, universities award higher degree. Ethiopian higher education institutions direct tremendous number of resources annually for implementation of thesis program. Millions of public monies are spent to finance the thesis program in the form of payment to advisors and examiners as well covering costs incurred by graduate students. Thousands of graduate students commit one full academic year to develop and complete their thesis paper—but even more several thousands of survey respondents and interviewee also spend their crucial time in giving responses and spending time with students and researcher. However, all these costs seemed to yield small return.

Numerous graduate students have shown poor performance in the writing of thesis paper. One of the yardsticks used to measure the quality of research paper is its appearance on journals, including international journals. Research and studies by graduate students at Ethiopian universities occupy

very insignificant position in international journals. Also, the publication of research article on local journals is at its infant stage. One possible interpretation of this fact is that most of the thesis papers are below par to the standards and quality set by journal articles.

Many students plagiarize and copy-paste the works of others. “We are not getting adequate guidance and feedback from advisors”, students complain, on the one hand; “students lack the basic essential skill before they sign in to thesis writing”— is the common cry of thesis advisers, on the other side of the coin. Studies have also shown that there exist capacity gaps among graduate students, including the writing skill deficit, which probably led students to copy-paste and plagiarize (Hagos, 2020).

Another important modality of research in higher learning institutions in Ethiopia is the kind of research undertaken by higher learning institutions through their academic staff, with a research grant provided by universities. These types of research are usually based on pre-selected research thematic areas and undertaken and administered by research centres and research divisions of universities. These thematic research as well as staff grant research has better qualities as compared to research conducted by the graduate students—however, there exist several evidence witnessing that the quality standards in general as well as the ethics and integrity of these studies in particular came out to be below par.

The lack of quality in research in higher learning institutions, in particular, poor performances in ethics and integrity, can only be addressed if significant intervention, driven by a comprehensive study in the area, is introduced. And therefore, this study is conducted to assess factors affecting research quality in Ethiopian higher learning institutions, giving a particular focus on research ethics and integrity. This study will provide an empirical assessment of ethical problems undermining research ethics and quality as well as identify the critical gaps that require reforms to enhance the performance of ethics and integrity of research in higher learning institutions.

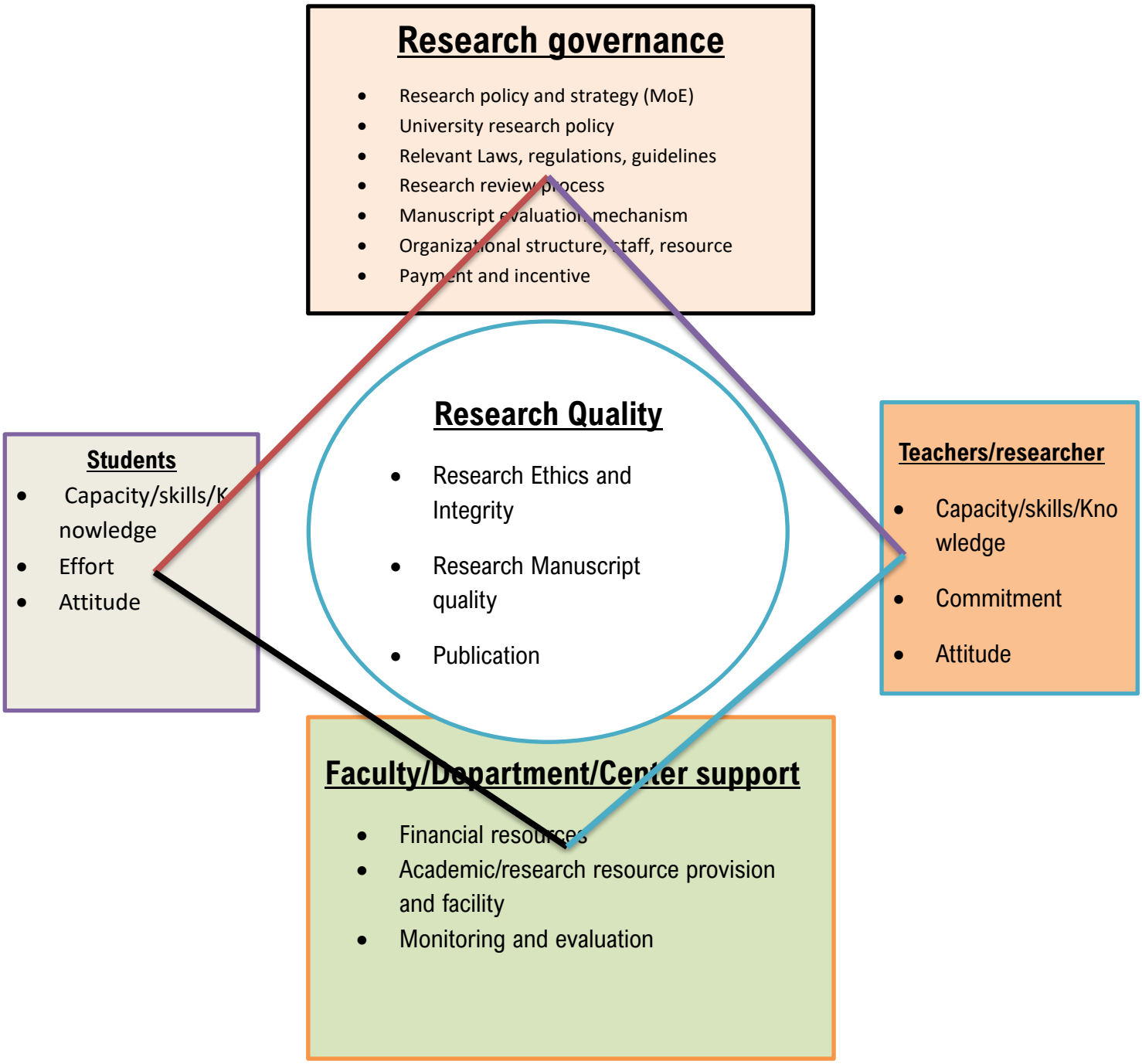
General Objective of the Study

The purpose of this study is to explore research ethics and integrity, its governance, factors, and critical challenges in higher learning institutions in Ethiopia

Specific Objective of the Study

- *To assess the degree of ethical problems and determine the status of research ethics and integrity in higher learning institutions in Ethiopia*
- *To explore and examine factors affecting research ethics and integrity in higher learning institutions in Ethiopia*
- *To identify and investigate critical challenges (along with their underlying root causes) undermining research ethics and integrity in higher learning institutions in Ethiopia*

5.3. Conceptual Framework



Source: Own computation from review of literature

Methodology

Research Design

This study employed a concurrent triangulation mixed research design in which both quantitative and qualitative research methods will be applied. The quantitative research method was used to assess the status of research ethics and integrity as well as factors affecting thereon in higher learning institutions in Ethiopia

The qualitative research method was used to further an in-depth exploration on governance of research as well as critical challenges and gaps undermining research ethics and integrity in higher learning institutions in Ethiopia.

Data Source and Data Collection Instruments

In this study both primary and secondary data were collected. The source of primary data was graduate students, lectures and researchers in three sample public universities: Ethiopian Civil Service University, Addis Ababa University, and Bahir Dar University. Secondary data was collected from these sample public universities and their colleges and faculties as well as from the Ministry of Science and Higher Education.

This study employed two major primary data collection instruments: survey questionnaire and semi-structured interview. A survey questionnaire was designed to assess research ethics and integrity of research conducted in higher learning institutions in Ethiopia as well as to identify relevant factors affecting research ethics and integrity. The semi-structured interview was used to explore and account the practice and governance of research as well as to identify critical gaps and challenges in this area.

Sample Size Determination and Sampling Techniques

The sampling unit of this study is an academic staff. This study, using survey and semi-structure interview, have collected data from three public universities. For the sample survey, proportional random sampling technique was employed to select sample respondents in each sample universities.

In these three public universities, sample respondents were selected for each university using a sampling formula of Yemane (1967). Thus, in the case of Ethiopian Civil Service University, from the total number of graduate degree students and teachers in 2015, 334 students were sampled; and in the case of Addis Ababa University, 388 sample students were selected; and in the case of Bahir Dar university, 388—in total 1110 teachers were selected as a total sample of this study.The total sample of each public university therefore were proportionally be distributed across their respective graduate degree programs in the field of social, in order to fully consider differences of program specializations in each university.

For the semi-structured interview, participants were drawn from sample public universities using purposive sampling. And in total, 36 participants (i.e.,3*12) were selected and interviewed using purposive sampling technique.

Data Processing and Analysis

The quantitative data from survey questionnaire was processed and analysed using SPSS. A reliability test using Cronbach's alpha was undertaken for each group of items in the survey. In addition, descriptive statistical tests (such as mean, standard deviation, weighted mean) were undertaken.

The qualitative data from semi-structured interview was meticulously transcribed. And then the qualitative data was manually coded and using coding and qualitative data analytical techniques,

an effort was made to produce significant themes that reveal and describe critical challenges hindering thesis writing program.

Validity and Reliability

Several measures were taken to maintain the validity and reliability of instruments and findings of this study. Cronbach's alpha test, as indicated the following Table, for each major variables and constructs were conducted. Besides, operational definition of each variable was consistently applied across all stages of this study starting from data collection up to analysis and interpretation. To ensure statistical and external validity of the data processing and analysis made on survey questionnaire, statistical tests and procedures were strictly applied. And to ensure the reliability of qualitative data analysis, several measures were also undertaken: the application of thorough coding, peer debriefing, thick and rich description, and effective data triangulation.

Table 14: Result of Cronbach's alpha reliability test

S. N	Variable/Related Items	Total Number of Items employed	Valid No of Items	Cronbatch's Alpha Test	Remark
1	Plagiarism, fabrication, and falsification	4	4	0.84	All items were qualified for Analysis
2	Protection of research participants	3	3	0.86	All items were qualified for Analysis
3	key privileges of respondents	4	4	0.81	All items were qualified for Analysis
4	Protection of the rights of vulnerable communities	5	5	0.89	All items were qualified for Analysis
5	Validity and reliability of research	5	5	0.87	All items were qualified for Analysis
6	Research ethics board	3	3	0.71	All items were qualified for Analysis
7	Thesis management	4	4	0.80	All items were qualified for Analysis
8	Feedback	7	7	0.74	All items were qualified for Analysis
9	Ethics and plagiarism	3	3	0.83	All items were qualified for Analysis
10	Resource for research	4	4	0.85	All items were qualified for Analysis

As seen in Table 1, Cronbach's alpha test was conducted for ten group of items and the alpha test revealed that these groups of items employed in survey questionnaire were reliable.

Result and Discussion

Descriptive Analysis

A sample survey was conducted on academic staff in three sample universities: ECSU, AAU, and BDU to measure a series of variables and items affecting the quality and integrity of research conducting in higher learning institutions. A total of 1110 respondents have participated in the survey. However, due to poor quality of returned survey questionnaire, 172 questionnaires were excluded from the sample. And therefore, a total of 938 (271 from ECSU, 330 from AAU, 338 from BDU) survey questionnaires were entered into SPSS. Presentation and descriptive analysis of survey result has been presented below.

Plagiarism, fabrication, and falsification

This study has attempted to measure the level of misrepresentation of data and use of information in research conducted in higher education. This malpractice could be manifested in the form of plagiarism, fabrication, and falsification. The following table has depicted the degree of researchers' level of misconduct on research in three universities.

Table 2: Mean value of research misconduct in sample universities

Items	ECSU	AAU	BDU	Total
	Mean	Mean	Mean	Mean
Plagiarism	2.61	2.65	2.41	2.56
Fabrication Or Falsification	2.65	2.36	2.67	2.56
False Biography	2.71	2.34	2.53	2.53
False Citation	2.85	2.51	2.54	2.63
Total	**2.74**	**2.40**	**2.58**	**2.57**

As indicated in the above table, the degree of misconduct in all four key attributes and in all the three sample public universities is reported to be close to be medium. Also, according to the data seen in the above table, there exists no significant difference among all four attributes. And as seen from the mean value of each university, the key attributes of research misconduct (measured in four constructs) are found to be relatively higher in the case of ECSU when compared to AAU and BDU. This data gives evidence that academicians working in higher learning institutions engage in research misconduct when they undertake research. The level of plagiarism/ fabrication/ falsification found to be relatively modest.

Protection of research participants

Research participants occupy the central position in any research undertakings as they provide empirical evidence to the study and therefore the protection and proper handling of both participants and their response is key for the successful undertaking of any research endeavour. This study measured the degree of challenges faced in this area employing three key attributes of participants: voluntary participation, the use of informed consent, and the protection and maintenance of the privacy of participants. The following table shows the level of severity of problems facing in the three sample public universities.

Table 3: Mean value of degree of problems existed in protection of research participants by sample universities

Items	ECSU	AAU	BDU	Total
	Mean	Mean	Mean	Mean
Level of problems faced to ensure voluntary participation	1.2	1.02	1.20	1.14
Level of problems faced to ensure ensuring Informed consent	1.56	1.41	1.35	1.44
Level of problems faced to ensure privacy	1.54	1.6	1.5	1.55
Total	1.43	1.34	1.35	1.38

As seen in the above table, the degree problems in ensuring voluntary participation are found to be very minimal (mean value=1.14), with no significant difference in performance of this attributes among sample public universities. Likewise, the use of informed consent during data collection is very significant in sample public universities as its challenges was found to be consistently insignificant across sample cases (mean value=1.44). The protection of maintenance of the privacy of respondents is also found to be very significant as challenges in this regard found to be insignificant (mean value=1.55). These data revealed that there exists a good practice in ensuring

voluntary participation of participants through informed consent as well as the protection and maintenance of responses and respondents in higher learning institutions.

Anonymity, confidentiality and other key privileges of respondents

This study has also investigated additional privileges of research participants and the degree of problems facing in this area. The following table have depicted the mean of performances of sample universities in ensuring key attributes of participant rights during the undertaking of research.

Table 4: Mean value of degree of problems in maintaining key privileges of respondents

Items	ECSU	AAU	BDU	Total
	Mean	Mean	Mean	Mean
Level of risk of anonymity	1.12	1.02	1.2	1.11
Level of risk of confidentiality	1.42	1.52	1.46	1.47
Level of risk in ensuring the right to non-response	1.40	1.20	1.11	1.24
Level of risk in ensuring the right to boycott from participation	1.01	1.2	1.2	1.14
Total	1.24	1.24	1.24	1.24

As indicated by the mean values in the above table, the performance of sample public universities regarding the degree of problems in ensuring anonymity is found to be very insignificant (mean value=1.11). Similarly, the level of problems in undermining confidentiality of responses and respondents is also found to be very minimal (mean value=1.47). The right of respondent to provide no response for research enquiries as well as to the right to boycott during participation were also found significant consistently across all sample public universities.

Protection of the rights of vulnerable communities

There exist several types of studies which significantly engages vulnerable individuals and communities during the entire process of research. One of the ethical dimensions of research deals with the due consideration of the rights of vulnerable individuals and communities during the conduct of research. The following table depicts the performance sample public universities.

Table 5: Mean value of key attributes in the protection of the rights of vulnerable communities in sample universities

Items	ECSU	AAU	BDU	Total
	Mean	Mean	Mean	Mean
Protection of minority groups	2.22	3.61	3.85	3.23
Contribution and scientific value	1.8	2.81	2.60	2.40
Respect for social value	2.10	3.05	3.20	2.78
Community engagement	1.68	3.25	3.02	2.65
Consideration of community culture and values	1.56	3.41	3.15	2.71
Total	1.78	3.24	3.12	2.71

The degree of efforts put into the protection of minority groups, by sample public universities, in undertaking research which involves the vulnerable section of the society, is found to be average. The performance of ECSU in this regard is significantly lower when compared to AAU and BDU. The overall performance of sample public universities regarding their respective contribution and scientific value is found to be far below average while there exist differences among universities, in which the performance of ECSU is far lower than AAU and BDU. Regarding the performance of universities in engaging the community in research, due consideration of social/community values and cultures while conducting research, were found to be consistently below average across all sample universities. These data imply that there exists a poor practice in sample universities

regarding the proper consideration and enforcement of measures to protect and maintain vulnerable groups of the society. Another potential reason could be the lack of highly qualitative and rigorous experimental research, which engages individual and communities, in sample public universities.

Validity and reliability of research

Validity and reliability of a research determines the quality of the research and by implication its significance, the higher the validity and reliability of a study, the higher the quality of the research. This study has attempted to measure the efforts of sample universities in making sure that studies in their respective institutions employ validity and reliability measures.

Table 6: Mean value of measures of validity and reliability in sample universities

Items	ECSU	AAU	BDU	Total
	Mean	Mean	Mean	Mean
Pilot test	1.25	3.55	3.25	2.68
Expert evaluation of survey questionnaire	2.5	3.40	3.12	3.01
Accounting/documenting qualitative analytical process	1.11	1.61	1.39	1.37
Member checking	1.25	1.91	1.82	1.66
Peer debriefing	1.70	1.85	1.63	1.73
Total	1.56	2.46	2.24	2.09

As indicated in the above table, except for the application of expert evaluation of survey questionnaire (mean value=3.01), the performance of validity and reliability measures were found to be consistently lower than average across sample universities. The application of validity and reliability measures in ECSU was significantly lower than AAU and BDU. In total, the performance of validity and reliability measures of sample universities was found to be low. These findings imply that the implementation of protocols and tools enhancing the validity and reliability of research is at infant stage. This is probably due to the general lack of institutional and structural arrangements that should be in place to advocate and enforce validity and reliability issues in higher learning institutions.

Research Ethics Board (REB)

The effective implementation and enforcement of research ethics requires permanent/standing organizational set-up. This study has explored these arrangements and their performance in sample universities. In addition to the survey questionnaire, the researcher has found out that except for ECSU, research ethics board/committee is functional in AAU and BDU. The following table depicts the effectiveness, and the quality of workforce engaged in research ethics board in sample universities.

Table 7 Mean value of variables affecting REB in sample universities

Items	AAU	BDU	Total
	Mean	Mean	Mean
Quality of experts working in REBs	4.1	3.8	3.95
Effectiveness of REBs	3.2	3.12	3.16
Potential Role of REBs	4.1	3.89	4.00
Total	3.80	3.60	3.70

As indicated in the above table, the expertise quality of employees working in research ethics board as well as the belief of respondents regarding the significance of the role attached to the ethics board is found to higher while the actual effectiveness of these committees was found to be average

in both higher learning institutions. These findings imply that focus should be given to the research ethics board to effectively play their role.

Thesis management

Effective management of thesis in schools and universities is also one of the critical factors for effective thesis writing. There are several mechanisms useful to undertake effective management of thesis writing, including effective topic allocation mechanism, monitoring of advisors, implementation of complaint handling, and the discipline to lead by fixed schedules, which is necessary to manage educational programs. The following table shows the degree of responses of graduate degree students on these issues.

Table 8: Level of effectiveness of management practices in thesis writing in ECSU, AAU, and BDU (in percentage)

Degree	ECSU, AAU, and BDU (Total)					
	Topic allocation	Monitoring advisors	Complaint handling	Led by schedule	Total	Cum. percentage
Very low (1)	17.5	24.5	24.1	5.03	17.7	17.7
Low (2)	19.9	30.9	30.9	15.5	24.2	41.94
Medium (3)	41	29.3	30.3	25.5	31.5	73.43
High (4)	13.9	10.2	9.94	28.4	15.7	89.12
Very high (5)	7.73	5.12	4.73	25.6	10.9	100
Total	100	100	100	100	100	
Mean	**2.74**	**2.41**	**2.4**	**3.54**	**2.78**	

On the range of management practices, the mean value of schedule (i.e. the degree to which departments and colleges manage thesis writing based on fixed schedule), which is 3.54, was found to be the highest when compared to other items; and followed by mean value of topic allocation (i.e. to what extent departments and colleges allocate thesis topic among advisors based on specialization), which was found to be 2.74. The relatively lower rates (as shown in the mean value) were registered in the case of monitoring and follow up on advisors as well as in handling complaint of, which was found to be 2.41 and 2.4, respectively. These data revealed that, except on the use of fixed schedule to manage the progress and completion of thesis (which is found relatively moderate), the overall management of thesis writing in sample higher education had suffered from significant limitation and can be said highly ineffective.

Table 15: Mean value of level of effectiveness of management practices in thesis writing by sample universities

Items	ECSU	AAU	BDU	Total
	Mean	Mean	Mean	Mean
Research topic allocation as per competence	2.61	2.83	2.72	2.72
Level of monitoring on advisors	2.42	2.35	2.33	2.37
Level of complaint handling	2.45	2.38	2.25	2.36
Effective application of schedule	3.61	3.47	3.41	3.50
Total	2.77	2.76	2.68	2.74

The above table revealed that the performance of items related to the management of thesis in all sample public universities have showed no significant difference; therefore, it can be said that thesis management in all sample universities was found to be equally ineffective, with significant limitation.

Feedback

Feedback is the major means to guide and enhance thesis of students and so occupies a central position in the advisor and advisee relationship. The following table depicts the mode of communication used to provide feedback for student's thesis.

Table 10: Degree of feedback received from advisors

Degree	ECSU, AAU, and BDU				
	Face-to-face	Verbal	Written	Total	Cum. Percentage
Very low (1)	30.30%	24.40%	23.60%	26.10%	26.10%
Low (2)	33.40%	22.50%	25.60%	27.17%	53.27%
Medium (3)	28.70%	25.60%	30.60%	28.30%	81.57%
High (4)	5.10%	14.40%	10.30%	9.93%	91.50%
Very high (5)	2.50%	13.10%	9.90%	8.50%	100.00%
Total	100.00%	100.00%	100.00%		
Mean	**2.41**	**2.64**	**2.51**	**2.52**	

The degree of feedback communicated in these three modes of communication, as indicated in the above table, is largely minimal. The level of face-to-face feedback is rated as low and very low by 63.7 per cent, as medium by 28.7 per cent, and high and very high by 7.6 per cent. Similarly, the level of verbal feedback is rated as low and very low by 46.9 per cent, as medium by 25.6 per cent and high and very high as 17.5 per cent. Regarding written feedback, student respondents provide similar rate with previous mode of communication.

Table 16: Average frequency of received feedback by each mode of communication by sample universities

Mode of feedback	ECSU	AAU	BDU	Total
	Mean	Mean	Mean	Mean
Verbal	2.81	2.37	2.51	2.56
Written	2.68	2.51	2.48	2.56
Face-to-face	2.38	2.43	2.22	2.34
Total	**2.62**	**2.44**	**2.40**	**2.49**

As indicated in the above table, the degree of feedback given to students in ECSU when compared to AAU and BDU is relatively higher in all three modes of communications. However, in all sample universities the degree of feedback given to students is below average. In total as indicated by the mean value of each type of mode of communication, which is below average (2.34 in the case of face-to-face feedback, 2.56 in the case of verbal feedback, and 2.55 in the case of written feedback)—the level of feedback given to graduate students is far from being adequate

Table 12: Degree of feedback quality in ECSU, AAU, and BDU

Degree	ECSU, AAU, BDU					
	Timeliness	Detail	Comprehensiveness	constructiveness	total	Cum. average
Very low (1)	25.1	26.4	24.3	23.1	24.7	24.7
Low (2)	31.8	28.1	30.5	32.8	30.8	55.5
Medium (3)	28.4	30.2	29.4	25.9	28.5	84.0
High (4)	10.8	11.3	11.5	12.3	11.5	95.5
Very high (5)	3.9	4	4.3	5.9	4.5	100.0
Total	100	100	100	100	100	
Mean	**2.33**	**2.39**	**2.37**	**2.32**	**2.35**	

When it comes to enhancing students' thesis quality, it is not only the amount and frequency of feedback that matters but also its quality. As indicated by the above table, most students have given lower rates for feedback across a series of quality criterions. The timeliness of feedback is rated as low and very low by 56.9 per cent; the level of detail of feedback received was rated as low and very low by 54.5 per cent; in terms of comprehensiveness, 54.7 per cent; and on constructiveness by 55.9 per cent. The mean value of all quality criterions, employed in this study, came out to be far below average (timelines, 2.33; detail, 2.39; comprehensiveness, 2.37; constructiveness, 2.32; total, 2.35). These figures imply that advisor's feedback for student's thesis have suffered a lot in terms of quality —and therefore significant improvements are imperative in this area to enhance the timeliness, degree of detail, comprehensiveness, and constructiveness of feedback.

Table 13: The mean value of degree of feedback quality by sample universities

Mode of feedback	ECSU	AAU	BDU	Total
	Mean	Mean	Mean	Mean
Timeliness	2.4	2.27	2.31	2.33
Detail	2.4	2.36	2.41	2.39
Comprehensiveness	2.5	2.31	2.30	2.37
Constructiveness	2.4	2.36	2.21	2.32
Total	2.4	2.33	**2.31**	2.35

As presented in the above table, in all quality criterions of feedback the performance of sample universities came out to be, consistently, far below average. Looking at the performance of each university, ECSU is found to have slightly higher performance followed by AAU and BDU.

Research ethics and plagiarism

Research ethics is one of the most missing ingredients in Ethiopian higher education. In this study, students' perception on plagiarism and unethical research conduct is assessed. The following table depicts the student's rate on departments' effort to address the issue of plagiarism and unethical research practice.

Table 14: Awareness, measures taken, and overall effort addressing plagiarism and unethical practices in thesis writin

Degree	ECSU, AAU, and BDU							
	Awareness creation	Cum. Percentage	Corrective measures taken	Cum. Percentage	Overall effort of depts to address plagiarism	Cum. Percentage	Total	Cum. Percentage
Very low (1)	15.1	15.1	12.5	12.5	11.1	11.1	12.9	12.9
Low (2)	24.5	39.6	15.8	28.3	25.4	36.5	21.9	34.8
Medium (3)	32.9	72.5	36.7	65.0	30.5	67.0	33.4	68.2
High (4)	20.3	92.8	21.6	86.6	20.4	87.4	20.8	88.9
Very high (5)	7.2	100.0	13.4	100.0	12.6	100.0	11.1	100.0
Total	100.0		100.0		100.0		100.0	
Mean	2.91		3.41		2.84		2.75	

As indicated in the above table, the level of activities targeting awareness creation among students in all sample universities is rated low and very low by 29.6 percent of respondents, medium by 32.9 percent, and high and very high by 27.5 per cent. The mean value in this regard is found to be 2.9. Regarding corrective measures taken to address unethical research conduct (such as

plagiarism), 28.3 percent of respondents have rated low and very low, 36.7 percent as medium, and 36.0 per cent as high and very high. The mean values of corrective measures are found to be 3.41, which is average. The overall effort of departments in all universities in addressing plagiarism is also found to be average (mean value=2.84). When these figures assessed all together; we can learn that the overall performance rated in addressing unethical research conduct and plagiarism is average—and therefore attention should be given to the issue.

Table 15: Mean value of efforts to forestall plagiarism by sample universities

Mode of feedback	ECSU	AAU	BDU	Total
	Mean	Mean	Mean	Mean
Awareness creation	2.76	2.89	2.81	2.82
Corrective measures taken	2.98	3.01	3.14	3.04
Overall effort of Dept. to address Plagiarism	2.81	3.21	3.01	3.01
Total	**2.85**	**3.03**	**2.98**	**2.96**

As seen in the above table, there exists a minor difference sample university in all items employed to measure efforts addressing plagiarism. In all three items of plagiarism and unethical research conduct, ECSU has performed slightly lower than AAU and BDU—though all achieved average performance in all these items.

Access to key resources for thesis research

The provision of key facilities and resources is believed to be essential for effective thesis writing process. In this regard, the availability and access to resources for thesis writing in ECSU, AAU, and BDU, according to student respondents, have been good in general.

The following table shows that significant number of high rates (high and very high) were given to access to reference books (53.2 %), published research papers (45.7%), digital access to journal articles (48.2), and research analytical software (28.69%). On the other hand, lower rates (low and very low) were observed in the case of research analytical software (36.1%), published research papers (27.2%), digital access to journal articles (21.5%), and reference books (20.6%). These ratings revealed that though the overall provision of resources relevant to research and thesis writing is good— the availability and access of some key resources such as research analytical software are in significant deficit. It is also imperative that access to reference books, digital access to journal articles and published research works also have a significant room for further improvement.

Table 16: Students' access to key resources for thesis writing in ECSU, AAU, and BDU

Degree	ECSU, AAU and BDU					
	Access to Reference book	Published research papers	Digital access	Research analytical software	Total	Cum. Percentage
Very low (1)	5.2	7.4	10.1	11.6	8.6	8.6
Low (2)	15.4	19.8	11.4	24.5	17.8	26.4
Medium (3)	26.2	27.1	30.3	35.3	29.7	56.1
High (4)	30.1	25.4	27	19.2	25.4	81.5
Very high (5)	23.1	20.3	21.2	9.4	18.5	100.0
Total	100	100	100	100	100	
Mean	3.49	3.28	3.25	2.74	3.19	

As indicated in the following table, there exist significant differences in this regard when comparisons are made between sample institutions: ECSU, AAU, and BDU. The mean value of access to reference books in AAU is 3.67, slightly closer to 4 (high rate) and found to be slightly

higher than while in BDU and ECSU. Regarding availability and access to published research papers, the mean value of ECSU came out to be 2.85 whereas AAU and BDU were found to be 3.59 and 3.41, respectively.

Table 17: Mean value of access of students to key resources for thesis writing

Mode of feedback	ECSU	AAU	BDU	Total
	Mean	Mean	Mean	Mean
Access to reference book	3.25	3.67	3.54	3.49
Published research papers	2.85	3.59	3.41	3.28
Digital access	3.21	3.31	3.22	3.25
Research analytical software	2.61	2.79	2.81	2.74
Total	**2.98**	**3.34**	**3.25**	**3.19**

There is also slight difference in terms of digital access to journal articles and research analytical software among sample universities. Regarding research analytical software, the performance of sample universities found to be consistently far below average. This figure implies that though all types of resources should be enhanced in higher education, though focus should be given to the availability, access and training of digital resources and research software.

Qualitative Analysis

The purpose of using qualitative method in this study was to explore and identify significant challenges undermining research quality and integrity in higher learning institutions. Qualitative data from semi-structured interview were collected. Therefore, the findings on problems and challenges inhibiting research quality and integrity in higher education institutions were organized in 6 qualitative categories; Lack of research budget, and inadequate incentive structure; teaching dominant culture in higher education institutions; research ethics board (REB) are not functional; lack of critical inputs for research;loose monitoring on key actors of thesis writing, advisors and advisee; ineffective feedback management system; research conferences, workshops, and seminars are too little; lack of commitment due to lack of Incentive; and students lack set of critical skills.

Conclusion

This study has examined the practices as well as factors affecting research ethics and integrity in Ethiopian higher education, taking ECSU, AAU, and BDU as a case. Regarding plagiarism, fabrication, and falsification, the degree of misconduct in all four key attributes and in all the three sample public universities is reported to be close to be medium, with no significant variation among institutions. Therefore, this study comes up with empirical evidence that academicians working in higher learning institutions engage in research misconduct when they undertake research. The level of plagiarism/fabrication/falsification found to be relatively modest.

Regarding protection of research participants, this study provides empirical evidence that there exists a good practice in ensuring voluntary participation of participants through informed consent as well as the protection and maintenance of responses and respondents in higher learning institutions.

Regarding anonymity, confidentiality and other key privileges of respondents, the performance of sample public universities regarding the degree of problems in ensuring anonymity is found to be very insignificant (mean value=1.11). Similarly, the level of problems in undermining confidentiality of responses and respondents is also found to be very minimal (mean value=1.47). The right of respondent to provide no response for research enquiries as well as to the right to

boycott during participation were also found significant consistently across all sample public universities.

Regarding protection of the rights of vulnerable communities, the degree of efforts put into the protection of minority groups, by sample public universities, is found to be average. In addition, the overall performance of sample public universities regarding their respective contribution and scientific value is found to be far below average. Regarding the performance of universities in engaging the community in research, due consideration of social/community values and cultures while conducting research, were found to be consistently below average across all sample universities. These data imply that there exists a poor practice in sample universities regarding the proper consideration and enforcement of measures to protect and maintain vulnerable groups of the society.

Regarding validity and reliability of research, the performance of validity and reliability measures were found to be consistently lower than average across sample universities. In total, the performance of validity and reliability measures of sample universities was found to be low. These findings imply that the implementation of protocols and tools enhancing the validity and reliability of research is at infant stage.

Regarding Research Ethics Board (REB), the researcher has found out that except for ECSU, research ethics board/committee is functional in AAU and BDU. However, the effectiveness of REB was found to be average in both higher learning institutions. These findings imply that focus should be given to the research ethics board to effectively play their role.

The effectiveness of thesis management, measured across several indicators, was also found below average in both sample institutions. Effective topic allocation as per competence, monitoring on advisors, and compliant handling— all came out to be below average. The relatively good thing regarding thesis management in sample institutions is found to be the implementation of schedule in managing the progress and completion of thesis project. The overall management of thesis writing in sample higher education had suffered from significant limitation, including the fact that advisors handle too much advisee, beyond their capacity to manage, and therefore can be said highly ineffective.

Regarding feedback, written feedback is the dominant mode of communicating ideas and comments from advisors to advisees in thesis writing in both higher institutions— communicating feedback through face-to-face, which is essential to clearly communicate comments and intents, is very minimal in all sample institutions. In addition, the quality of feedback, measured in terms of timeliness, degree of detail, comprehensiveness, constructiveness—were found to be below average. Students do not only complain about the degree of feedback but also about its quality.

Practices on combating plagiarism and integrity in thesis writing were also found to have significant limitations, including in awareness creation and taking corrective measures.

Regarding performances of sample universities in availing relevant resources and facilities in thesis writing, measured in terms of access to reference books, published research papers, access to digital resources, access to research analytical software—all registered average performance. And in all institutions, students' access to analytical software was found to be below average.

The overall research, its ethics and integrity in public higher education institutions suffer significant limitations, including Lack of research budget, and inadequate incentive structure; teaching dominant culture in higher education institutions; ineffective Research Ethics Board (REB). The existence of loose monitoring and evaluation system on the key actors— advisors and students. The management of thesis feedback in general, the guidance, documentation, utilization, and monitoring were found to be ineffective. Advisors' commitment is also inhibited by poor

incentive mechanism in place. Students lack key set of critical skills, including English language and writing. Finally, the lack of vibrant research culture and practice in sample institutions were found to play an inhibiting role for research ethics and integrity higher education institutions.

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5.4. The Practice and Challenges of the Implementation of Competency Based Curriculum in Higher Education Institutions of Ethiopia

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Abstract

The general objective of this study was to examine the implementation of competency-based curriculum in higher education institutions of Ethiopia. A concurrent embedded mixed research design was employed to conduct the study. Data were collected from 279 instructors and 384 regular undergraduate students selected using stratified random sampling method for the questionnaire. A total of 12 deans and department heads were selected using purposive sampling technique for an interview. The quantitative data was analyzed using descriptive and T- test. The result of the study shows that the competency-based curriculum implemented in higher education institutions of Ethiopia was fairly implemented. This was due to lack of well-organized curriculum, instructors' readiness and conducive institutional environment to implement competency-based curriculum. Among the challenges that hinder the effective curriculum implementation lack of resources, lack of students' motivation and weak university industry linkage was ranked as 1st, 2nd and 3rd respectively. To sum, the implementation of the competency-based curriculum in Ethiopian higher education institutions faced significant challenges. Finally, an attempt was made to suggest some recommendations related to revision of the curriculum, instructor's professional development, creating conducive institutional environment and as well as the need for establishing strong university-industry linkages

Key words: Competency, characteristics of curriculum, characteristics of lecturer, characteristics of institution, implementation

Introduction

Countries around the world have been challenged by the continually changing science and technology and global market. The rapid advancements in technology have transformed the labor market, necessitating individuals to possess flexibility, creativity, interactivity, and proficiency in information and communication technology (Skills, 2010).In light of these challenges, there is a need for a global education system that redefines the notion of valid knowledge and embraces effective approaches to teaching and learning in the 21st century (Sundberg & Wahlström, 2012). Recognizing the necessity of adequately preparing individuals for the complexities of the modern world, educational reform has become imperative (Gordon et al., 2009; Willbergh, 2015). The goal is to equip students with the necessary knowledge, skills, and attitudes to address the complex social and economic challenges of today's society (Hamilton et al., 2010).

International organizations such as UNESCO, OECD, and the EU have taken a leading role in advocating for the redefinition of school curricula and emphasize the integration of key

competencies (Gordon et al., 2009; Halasz& Michael, 2011). This emphasis on competency-based education (CBE) has gained recognition and is being integrated into education systems globally (Gardner, 2017). The shift towards competency-based curriculum is motivated by the need to prioritize the development of competencies, as they are crucial for employability and establishing a meaningful connection between learning and real-world problems (Mulder, Weigel, & Collins, 2007).

Therefore, to prepare professionals for diverse job opportunities higher education institutions need to revise their curricula and strengthen mode of deliveries to equip graduates with the required competencies needed to satisfy the need of customers (Witt & Gebbie, 2016). Cognizant to this, Ethiopia had launched a new 'educational roadmap' in 2018 to transform its educational system to competency-based education to accord with the requirements of 21st century education systems that play roles of transforming the socio-economic development of the nation (Nisrane, 2020).

Based on the education roadmap, a new curriculum was introduced with the objective of producing university graduates who possess a combination of cognitive and non-cognitive skills. This curriculum aims to develop higher-order thinking skills such as critical thinking, creative thinking, and problem-solving abilities. The modules were prepared with the vision of nurturing well-rounded individuals equipped with 21st-century skills and competencies (MoE, 2018). Focusing on the competencies that the graduates need to attain by integrating knowledge and skills and aspire to effectively prepare professionals for diverse job opportunities in the areas where the country needs skilled professionals (MoE, 2018).

However, government and private employers are not happy with the competence of graduates from universities. This is because higher education fails to properly implement the competency-based curriculum. This idea is supported by studies carried out at national level. For example, a study conducted by Likisa (2018) to assess the challenges and prospects of competency-based education in Adama science and technology university the result of the study reveals that curriculum designers and teachers often lack adequate training and awareness of the nature, focus, assessment, and development of competency-based education.

Similarly, a research carried out by Molla, et.al (2023) entitled the current status of faculty members' pedagogical competence in developing 21st century skills at selected universities in Ethiopia shows that the pedagogical practices of the faculty member s were with the usual conventional direct lecture, which is insignificant to bringing a paradigm shift from knowledge-based instructional practice to the 21st century competence of knowledge-based instruction. This will have the adverse effect that graduates will lack the skills necessary for employment and success in the workplace.

To assess the role of university industry linkage in implementing competency-based curriculum in public higher learning institutions in Ethiopia Teressa, &Besha (2020) reviewed many journals however, the result of their review reveals that most of them were not concerned regarding the role of higher learning institutions and industries in implementing the competence-based curriculum. Though there were some attempts by the researchers to examine the implementation of competency-based education, these studies did not properly address the three factors that affect the effective implementation of a competency-based curriculum. Thus, this study was designed to fill the gap by studying the three factors affecting effective implementation of competency base curriculum. To this end, the researcher is initiated to study the

implementation of the competency-based curriculum in higher education of Ethiopia.

Objective of the study

The general objective of this study was to examine the implementation of competency-based education in higher curriculum institutions of Ethiopia.

The specific objective of this study is to

1. To describe the practice of competency-based curriculum implementation in higher education institutions.

2. To assess the challenges that affects the implementation of a competency-based curriculum in higher education institution.

Basic Research questions

*1.*How is the practice of competency-based curriculum implementation in higher education institutions?

2.What are the challenges that impact the implementation of a competency-based curriculum in higher education institutions?

Review of Related Literature

Factors Influencing Curriculum Implementation

Characteristics of the Institution

Curriculum implementation in higher education institutions is influenced by both political and cultural dimensions within the organization. Several institutional factors play a pivotal role in shaping the effective implementation of curriculum, including organizational culture (shared vision, institutional leadership, professional development, resource availability) (Mortimer &Sathre, 2007), and the linkage between universities and industries (Tamrat, 2014).

Organizational culture

Shared Vision*:* Building a shared vision among stakeholders is crucial for effective curriculum implementation. It fosters a sense of unity and ownership among those involved in the process. This shared understanding includes a collective knowledge of how team members contribute to developing and executing the curriculum (Innes, 2004).

Institutional Leadership: Institutional leaders, due to their proximity to the classroom environment, have a significant impact on curriculum implementation. Effective leadership, characterized by participation and distribution of responsibilities, is vital for success. Strong and supportive leadership, accepted by academic staff, motivates and mobilizes them around educational objectives related to the curriculum (Fullan ,2007).

Professional Development*:* Professional development is essential for empowering staff to effectively implement the curriculum. Staff members need to stay updated with curriculum-related developments to ensure effective implementation. This involves continuous capacity-building to enhance their knowledge and skills (MacDonald, *et.al.*, 2017).

Availability and adequacy of resources: About curriculum implementation, adequacy of resources refers to adequacy of appropriate equipment, teaching materials, classrooms, laboratories, finances, workshops and adequately qualified human resources to support the

implementation process (Rudhumbu, 2015). For the curriculum to be effectively implemented, these resources must already be there before the implementation process begins to avoid time-wasting. In terms of human resources, a diverse well-qualified and experienced staff enable the sharing of diverse ideas necessary for effective curriculum implementation (Yang, 2013).

***University industry linkage*:** It is already recognized that the importance of linkage of higher education institutions with various industries for one's country sustainable development. Collaboration between universities and industries is critical for skills development, effective university and industry linkage can affect the competence of graduates, the ability of solving problems, and in general the speedy of economic development of the country (Guimón,2013).

Characteristics of the Instructor

Instructors' beliefs about teaching and learning shape their instructional practices, with two main perspectives: teacher-centered and learner-centered approaches (Smith, 2010). Teacher-centered approaches involve knowledge transmission through lectures (Weimer, 2013), Learner-centered approaches emphasize active participation and independent inquiry, and within this framework, competency-based education aligns with the learner-centered approach (Cantrell, Kool, & Kouwenhoven, 2010). In competency-based education assessment focused on competencies. Aspects are mainly assessment of competencies, rather than knowledge and skills; assessment is both formative and summative and forms an integral part of the process of the development of competencies (Cantrell, Kool, & Kouwenhoven, 2010). Teachers' beliefs and their level of preparedness significantly impact the quality and style of curriculum implementation (Koskei, 2015). On top of this, Hargreaves (2000), states that positive attitudes and enthusiasm among instructors are crucial for the success of curriculum implementation.

Nature of the Curriculum

Research shows that the nature or characteristics of the curriculum can either hinder or drive its successful implementation (Schagen, 2011). These characteristics can include the need for the curriculum, clarity, complexity and practicality of a curriculum.

Need for curriculum/innovation: This relates to the motivation for the curriculum and to answering the question: what is the purpose of the curriculum or is there a need for the curriculum? Koo (2009) says teachers who feel that the innovation or curriculum is relevant to their own needs as well as students' needs usually more willingly and enthusiastically implement it compared to those who do not see the need for it.

***Clarity*:** refers not only to details but also to the general sense of direction and purpose of the innovation (Fullan, 2007). In their discussion on what they called action images about implementation of innovations, Mules and Louis (1990 in Koo 2009) argue that people are always eager to implement innovations which they have an image or sense of in terms of what it means and what to do to get there (to successfully implement it).

***Complexity**:* of the curriculum Complexity relates to how ambitious and demanding an innovation or curriculum is (Fullan, 2007). It also refers to how challenging the teachers find the innovation or curriculum implementation. Complexity could be viewed in terms of the following three situations: Possibility of new or revised curriculum materials; possibility of using new and unfamiliar teaching approaches; and possibility of alteration of practices, behaviours and beliefs long held and cherished by teachers (Fullan, 2007).

Practicality of the curriculum: the quality and practicality of an innovation depends on whether

it addresses real classroom situations. It also refers to quality and availability of human, material and technological resources that meet the needs of both the teachers and students (Fullan, 2007). Such resources need to be appropriate and usable in the implementation of an innovation or curriculum. Fullan (2007) further argues that the success of the curriculum implementation process can be significantly impacted by how the curriculum as an innovation is perceived in terms of being specific, concrete, and practical in addressing real classroom teaching situations.

The factors influencing curriculum implementation are interconnected and mutually dependent. The design and content of the curriculum determine the implementation requirements and challenges, while the institution's characteristics provide the essential support and resources for successful implementation. Additionally, the instructor's qualities influence how the curriculum is delivered and tailored to meet student needs.

Conceptual framework

Independent variables Dependent variables

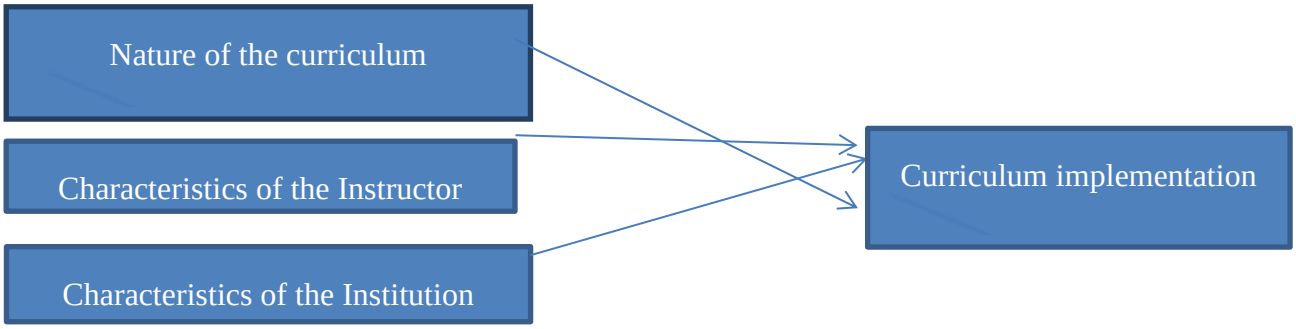

Fig 1. Conceptual framework developed by the researcher

Methodology Research Design

In this study, concurrent embedded mixed research design was employed. concurrent embedded design is a mixed methods design in which one data set provides a supportive, secondary role in a study based primarily on the other data type (Creswell, Plano Clark, *et al.*, 2003). The premises of this design are that a single data set is not sufficient, that different questions need to be answered, and that each type of question requires different types of data.

Sample Size and Sampling Technique

In Ethiopia, there are 46 public universities categorized into three based on their mission. For this study, a stratified random sampling method was employed to select university samples. The sample universities were chosen from research universities, applied universities, and comprehensive universities, ensuring representation from all categories. After stratification, two universities were selected from each category, making a total of six universities using quota sampling. The selected universities include Addis Ababa and Hawassa from research universities, Assosa and Wolkite from applied universities, and Wachamo and Selalea from comprehensive universities.

Furthermore, a total of 279 academic staff members from the universities were selected using a stratified random sampling method based on their qualifications. The individual units were then chosen using a systematic random sampling method. Similarly, 384 undergraduate students from

the universities were selected using a stratified random sampling method based on their year of study. The individual units were chosen using a systematic random sampling method. Moreover, a total 12 deans and department heads were selected using purposive sampling technique for interview. The sample size was determined using the research advisor's table.

Data collection Procedures and Methods of Data Analysis

Questionnaire*:* The researcher used questionnaires as a primary data collection method. The questionnaire employed a five-point Likert scale and included both open-ended and closed-ended questions. The questionnaire was divided into seven parts and consists of a total of 57 items. The questionnaires were distributed to 279 instructors and 384 regular undergraduate students. The questionnaires were distributed to individuals with research experience and language proficiency to ensure item validity. Feedback from these experts was received and used to revise the questionnaire. The reliability of questionnaire was tested using cronbach alpha method and the computed reliability of the instrument was 0.78. Thus, the instrument was found valuable to collect data for the main study.

Interviews*:* Semi-structured interviews were conducted with a purposefully selected group of 12 top and middle-level managers from universities. These individuals were chosen based on their perceived comprehensive knowledge of the subject matter being studied. This method allowed for in-depth, qualitative insights from key stakeholders.

Document Analysis*:* One randomly selected module, specifically the "critical thinking" module, was subject to document analysis. This process likely involved examining and interpreting relevant documents, such as curriculum materials or instructional content related to critical thinking.

Methods of Data Analysis

The quantitative data collected through survey questionnaire were processed and analyzed through descriptive and inferential statistics using SPSS, version 24. Descriptive statistics (mean) and inferential statistics (T-test) were used to present data collected through questionnaire.

On the other hand, the qualitative data obtained from the field was organized and analyzed thematically. The interview was transcribed and followed by generating the relevant data through indexing and coding. Next, general patterns and main themes were created and reviewed in response to research questions. Finally, qualitative data were used to either confirm or disconfirm results from the quantitative phase of the study.

Result and Discussion

Characteristics of the Curriculum

Table 1 Instructors and Students Responses Regarding Characteristics of the Lecturer

No	Statement	Instructors	Students	t	df	p
		Mean	Mean			
1	Characteristics of the Curriculum	2.63	2.87	4.1	631	.000

The results in Table (4.1) reveal that the mean value for the nature of the curriculum was (M=2.63) for instructors and (M=2.87) for students. This indicates that both instructors and students agree that the competency-based curriculum was not well organized, as the mean values are below the

ideal mean value of (M=3.0). However, the Levene's T-test, with (p=.000, df=631, and p<.05), revealed that there is a significant difference between the responses of the instructors and students. Similarly, the qualitative results from interviews and content analysis support the notion that the curriculum was not well organized. Combining the quantitative and qualitative data, despite the difference in opinion between instructors and students, it is reasonable to conclude that the curriculum was not well organized.

Characteristics of the Instructor

Table 2. Instructors and Students responses Regarding Characteristics of the Instructor

No	Statement	Instructors	Students	t	df	p
		Mean	Mean			
1	Learner-centered approaches	2.6	2.8	.715	655	.475
2	Continuous assessment	2.7	2.6	1.486	658	.138
3	Lecturers attitude and motivation	2.4	2.68	2.054	593	.04

The result in table (4.2) revels that the mean value for the practice of student-centered approach during the implementation of competency-based curriculum in higher education institutions of Ethiopia was (M=2.66) for instructors and (M=2.7) for students. This indicates instructors fail to use student-centered approach. It reasonable to conclude on this because the Levene's T –test at (p=.475, df=655 and p>.05), revealed that there is no significant difference between the responses of the instructors and students.

The result in table (4.2) also reveals that the mean value for the practice of continuous assessment was (M=2.7) for instructors and (M=2.65) for students. This indicates instructors fail to use continuous assessment during the implementation of the curriculum. The qualitative results from interviews with top and middle-level managers of the universities confirmed the quantitative findings. It reasonable to conclude on this because the Levene's T –test at (p=.138, df=658 and p>.05), revealed that there is no significant difference between the responses of the instructors and students.

The results in Table (4.2) reveal that the mean value for lecturers' attitude and motivation towards competency-based curriculum in higher education institutions of Ethiopia was (2.44) for instructors and (2.68) for students. This indicates the attitude and motivation of instructors towards the curriculum was negative, as the mean values are below the ideal mean value of (M=3.0). However, the Levene's T –test at (p=.04, df=593 and p<.05), revealed that there is significant difference between the responses of the instructors and students. Despite the disparity in perception between instructors and students, the findings suggest a reasonable conclusion that the instructors were implementing the curriculum without motivation and with a negative attitude.

Characteristics of the Institution

Table 3: Instructors and Students response Regarding Characteristics of the Institution

No	Statement	Instructors	Students	t	df	p
		Mean	Mean			
1	Organizational culture	2.35	2.66	3.808	641	.000
2	Availability of resources	2.6	2.58	2.088	641	.037
3	University industry linkage	2.44	2.3	1.264	631	.20

The result in table (4.3) revels that the mean value for the organizational culture of the institution during the implementation of competency-based curriculum in higher education institutions of

Ethiopia was (M=2.35) for instructors and (M=2.66) for students. This indicates that the organizational culture was not conducive to implement the curriculum, as the mean values are below the ideal mean value of (M=3.0). However, the Levene's T –test at (p=.000, df=641 and p<.05). Revealed that there is significant difference between the responses of the instructors and students. Despite the disparity in perception between instructors and students, the findings suggest a reasonable conclusion that the failed to create conducive organizational culture to implement the curriculum.

The result in table (4.3) revels that the mean value for the availability of resources during the implementation of competency-based curriculum in higher education institutions of Ethiopia was (M=2.46) for instructors and (M=2.58) for students. This indicates the that institutions fail to allocate the required resource, as the mean values are below the ideal mean value of (M=3.0). However, the Levene's T –test at (p=.037, df=641 and p<.05), revealed that there is significant difference between the responses of the instructors and students. Despite the disparity in perception between instructors and students, the findings suggest a reasonable conclusion that the institutions fail to allocate adequate and relevant resources and facilities to implement the curriculum.

The result in table (4.3) revels that the grand mean value for the practice of university industry linkage during the implementation of competency-based curriculum in higher education institutions of Ethiopia was (M=2.44) for instructors and (M=2.53) for students. This indicates there was weak university industry linkage during the implementation of competency-based curriculum in higher education institutions of Ethiopia. It reasonable to conclude on this because the Levene's T –test at (p=.207, df=631 and p>.05), revealed that there is no significant difference between the responses of the instructors and students.

4.Level of Awareness of Stakeholders

Table 4: Instructors and Students Responses Regarding the level of Awareness of Stake Holders

No	Statement	Instructors	Students	t	df	p
		Mean	Mean			
1	Level of awareness of stakeholders	2.06	2.25	4.150	658	.000

The result in table (4.4) revels that the mean value for the level of awareness of stake holders concerning the implementation of competency-based curriculum in higher education institutions of Ethiopia was (2.06) for instructors and (2.25) for students. This indicates the level of awareness of stake holders concerning the implementation of competency-based curriculum in higher education institutions of Ethiopia was low, as the mean values are below the ideal mean value of (M=3.0). However, the Levene's T –test at (p=.000, df=658 and p<.05), revealed that there is significant difference between the responses of the instructors and students. Despite the disparity in perception between instructors and students, the findings suggest a reasonable conclusion that the level of awareness of stake holders concerning the implementation of curriculum was low

Challenges of Effective Competency –Based curriculum Implementation

Table .5: Challenges of Effective Competency –Based curriculum Implementation

No.	Item	lecturers	Students	Average Mean	t	df	p
1	Lack of supportive resource to implement competency-based curriculum	2.74	3.63	3.15	17.5	658	.000
2	Lack of support from university leaders	2.72	3.62	3.05			
3	The content of the curriculum	2.60	3.60	3.07			
4	Lack of instructors' readiness to accept the new curriculum	2.57	3.55	2.98			
5	Lack of awareness on competency-based curriculum	2.55	3.52	3.02			
6	Lack of instructors' interest to implement competency-based curriculum	2.53	3.50	3.05			
7	Students' negative attitude towards the new curriculum	2.4982	3.48	3.12			
8	Weak university-industry linkage	2.4588	3.43	3.08			

The above table (4.5) indicates that among the eight factors that affect the effective curriculum implementation in higher education institution of Ethiopia. Lack of supportive resource to implement competency-based curriculum stand 1st with mean score (M= 3.15), Students' negative attitude towards the new curriculum stand 2ndwith mean score (M=3.12) and Weak university-industry linkage stand 3rd with a mean score (M=3.08) on the contrary the list mean score (M=2.98) is less than the ideal mean implying that instructors' readiness to accept the new curriculum was not a major barrier for the implementation of the competency based curriculum. However, it not reasonable to conclude on this because the Levene's T –test at (p=.000, df=658 and p<.05), revealed that there is significant difference between the responses of the instructors and students. This suggests that the disparity in their views may be attributed to the way they perceive and interpret the challenges presented by the curriculum.

Summary of findings

Characteristics of the Curriculum

The curriculum was not well organized to enable the effective implementation of the competency-based approach. Schagen (2011) and Luo (2016) have noted that the characteristics of a curriculum can either facilitate or impede its successful implementation.

Characteristics of the Instructor

The findings reveal that instructors fail to embrace a student-centered approach. This contradicts with the principle of competency based approach, learner-centered approaches emphasize active participation and independent inquiry, and within this framework, competency-based education aligns with the learner-centered philosophy (Cantrell, Kool, & Kouwenhoven, 2010).Moreover, instructors in Higher education institutions of Ethiopia heavily rely on pencil-and-paper tests as the main assessment method, neglecting the use of formative assessment. Relying on test scores alone do not provide a comprehensive understanding of academic progress. By contrast, when continuous assessment is employed for formative purposes, it can make a significant and vital

contribution to students' learning. In turn, this approach can effectively improve their performance in graded assessments (Muskin, 2017).

The findings indicate that teachers exhibit moderately low enthusiasm and attitude towards the competency-based curriculum. This contradicts with a study by Waigera et al. (2020) which found a significant correlation between teachers' attitudes and successful implementation of the competency-based curriculum. A more positive attitude among teachers is associated with greater implementation success.

Characteristics of the Institution

The findings indicate that the institution failed to create conducive organizational culture to implement the curriculum.

The findings indicate that there was lack of adequate resource Regarding resources lack of adequate time to implement the curriculum. This is related with the idea of McShane, for him quality curriculum implementation requires adequate and relevant resources and facilities While lack of resources and facilities frustrates teachers and diminishes their motivation the availability of resources empowers teachers and other employees (McShane, 2009).

The findings indicate that there were weak university-industry linkages. This contradicts Guimón's idea that collaboration between universities and industries is vital for skill development. Establishing effective linkages positively impacts graduates' competence, problem-solving abilities, and contributes to economic development (Guimón, 2013).

Regarding stakeholder's awareness the results indicate that universities were not effectively informing stakeholders, namely instructors, students, and industries, about their responsibilities in implementing the curriculum. This contradicts the notion put forth by Fullan, which emphasizes the importance of involving stakeholders and increasing their awareness to foster ownership, commitment, and collaboration for improved teaching and learning outcomes (Fullan, 2007).

Moreover, among the challenges that hinder the effective curriculum implementation lack of resources, lack of students' motivation and weak university industry linkage was ranked as 1st, 2nd and 3rd respectively.

Conclusion

The finding of the study suggests that the competency-based curriculum implemented in higher education institutions of Ethiopia was fairly implemented. This was due to the lack of relevance in the curriculum's content, an overload of general and impractical material, and the absence of a clearly defined implementation strategy. In general, it was not well organized to enable the effective implementation of the competency-based curriculum. Moreover, it was due to instructor's inability to employ competency-based approach such as learner centered and continuous assessment. The institution was not conducive to implement the competency base education due to lack of shared vision, shared governance, supportive leadership, inadequate resources and facilities, weak university-industry linkage and stakeholders' awareness and involvement. Among the challenges that hinder the effective curriculum implementation lack of resources, lack of student's motivation and weak university industry linkage was ranked as 1st, 2nd and 3rd respectively.

Recommendations

The ministry of education must review and rise curriculum to address the issues of relevance, overloading, and impracticality. The content should be streamlined to focus on key competencies and ensure that it aligns with the needs of the industry and students. Through conducting need assessment.

Universities must provide training and professional development opportunities for lecturers to enhance their competencies in delivering the competency-based curriculum. This could include workshops, seminars, and mentorship programs to improve their teaching methods, assessment techniques, and subject matter expertise.

Institutions must work towards creating a conducive environment for implementing the competency-based curriculum. This includes fostering a shared vision and shared governance among stakeholders, providing supportive leadership, and promoting collaboration and communication within all stakeholders.

Institutions must ensure that adequate resources and facilities are provided to support the implementation of the competency-based curriculum. This includes funding for instructional materials, technology, and infrastructure upgrades. Additionally, establishing strong university-industry linkages can help bridge the gap between academia and the real-world application of competencies.

Institutions must increase stakeholders' awareness and involvement in curriculum development and implementation. This can be done through regular consultations, partnerships with industry professionals, and engagement with alumni and employers. Involving stakeholders will ensure that the curriculum remains relevant and responsive to the needs of the job market.

Conduct additional research to explore the factors not included in the current study that contribute to the variation in curriculum implementation. This will help identify other areas for improvement and provide a more comprehensive understanding of the challenges and opportunities for effective curriculum implementation.

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5.5. A quest for Transforming Ethiopian Higher Education System (HES): Implications for Public Sector Transformation

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Abstract

The Higher Education System (HEIs) are demanded, nowadays more than ever before, to be frontiers of public sector transformation by directing their research, teaching, and services to societal needs; and by delivering transformative outcomes. Practically, nonetheless, the Ethiopian HES is currently facing unprecedented challenges, which cannot be abated unless systematic transformation is put in place. The Purpose of the study was, therefore, to investigate the hitherto reform rationales and the causes for some reform failures, and the feasible expeditions for transforming the Ethiopian HES. Exclusively a qualitative approach was used by generating data from document scrutiny and interviews. The results have shown that the hitherto reform rationales were the HEIs' mandates, aspirations, expectations; dynamisms, challenges; and failed previous reforms due to top-down initiatives, loose accountability and momentum, unengaged leadership, undesirable institutional culture, piecemeal/surface symptoms, nominal board assignment and culture, unaligned budget with mission, overly and ineffective communication, and focusing just on the visible ignoring the invisibles. Ways of transforming the HES and sustaining it demands aligning transformation initiatives with the institutional mandates, aspirations, expectations, and the dynamisms; progressively overcoming the challenges; approaching transformation systemically; transforming the very assumptions of HES; building a culture of indigenous knowledge paradigm; institutionalizing transformation endeavors; enhancing ownership and instructional leadership; and enforcing autonomy with accountability.

Keywords: *Reform, Higher Education, Transformation, Quality Education, Public Sector*

Introduction

This section presents conceptual and theoretical background, problem statement, objectives, and methods of the study. It stands as a backstage for the subsequent sections, namely, results and discussions, and conclusions and implications.

Conceptual and Theoretical background of the Study

Higher Education (HE) is an ideal place, and the professionals therein are ideal people to impact graduates, workforces, other sectors, and the society. HE "can and should be a major catalyst for development in all its dimensions, and the wider transformation of [a] society" (CHE, 2015:2). HE candothisby transforming, liberating or freeing the individualstudents, giving them a chance to re ason and developreasoning skills and critical thinking skills.

Transformation of students is informed by what is taught, how it is taught,
how the work is assessed and how students process the information (Masuku et al. 2021). In so doing, HE is one of the key drivers of growth performance, prosperity, and competitiveness in

global, national, regional and local economies. It has a wide-ranging, proven influence on the economy through producing people who are: 1) life-long learners; 2) critical and creative thinkers; 3) analyzers and solvers of problems; 4) well informed, empowered, committed, and deeply motivated; and 5) knowledgeable, skillful, enlightened, inspired and innovative citizens, possibly with quality and by quality wherein people are at the center of Input-Process-output-Impact (Firdissa, 2018, 2022; Masuku, Jili, & Sabela, 2021).

Inasmuch as the role of HE is closely linked to development, it is entrusted with: 1) arming graduates with relevant competencies, increasing their employability, and boosting their earning power; 2) bestowing on workers the necessary competencies and/or upgrading the existing; 3) generating research and innovation, diffusing them- with the aim of finding solutions to critical challenges; 4) feeding into a knowledge-based economy, which depends on a highly skilled, well-educated, and technically-equipped workforce; 5) contributing to the rate of technical progress or a rise in 'total' productivity by increasing labor and capital productivity; and 6) standing a hub for knowledge management, and knowledge sharing so as to build a more sustainable world-economically, socially, and politically (Firdissa, 2022).

A further closer scrutiny of the HE environments have also shown that the sector is changing rapidly due to the rise of a knowledge-based society; social, economic and information globalization; increased demand for higher education; and changes in the political and social environment of many countries including ours-all of which influence the HES in many ways.

First, since the latter half of the 20th century, we have been witnessing a shift from economic growth led by mass production industry based on the established technology- to knowledge-based growth in which hard and soft innovation (creation of knowledge) has a higher economic value. Second, due to the striking development of information technology in recent years, the movement of people, goods, money and information has become much easier, and globalization of the world economy has been accelerated (Firdissa, 2022). Third, the rising demand for higher education (earlier following World War II) has come with the necessity of mastering new knowledge and technology demanding educational credentials. Consequently, HE has been remarkably expanded throughout the world, and yet at varying rates and degrees of achievements. Fourth, changes in political and social environments of many countries from the 1990s and the recent international situation have demanded the HE sector to contribute to the development of a healthy civil society and cultivation of social cohesion.

A closer scrutiny of Ethiopia's policies, programs, projects, and efforts manifests that the country aspires to achieve all-inclusive prosperity. To materialize that, it has legislated HE specific national legal policies and strategies, frameworks, and roles and responsibilities; and planned, invested, and expanded HEIs resulting in a remarkable increase in institutions, programs and student enrollments both at undergraduate and postgraduate levels in public as well as in private HEIs. The expansion, and increments are in line with the intent of the country to:

1) establish a HE system which focuses on results-based management, administration and performance that recognizes and scales up best practices.

2) produce a higher level skilled and capable human power as per the demand of the development of the country in general and that of the manufacturing industry in particular.

3) ensure higher education enrolment that prioritizes areas critical to the economy.

4) assure HEIs that have achieved quality and relevance in accordance with the demands of the economy; and

5) enhance the competitiveness and competency of female students to promote their success and ensure gender equity (Firdissa, 2022).

The Ethiopian HE, as elsewhere, is in an era of both opportunities and challenges. In the first place, we are witnessing, a renewed passion for higher education, research, and innovation; accountability to taxpayers by adding values for the bucks and for the bungs- leading to authentic transformation, and interconnectedness, globalization, and networked designs all catalyzing the role of HE for development by producing enlightened workforce, creating knowledge, and serving the citizens.

Secondly, on the other hand, the Ethiopian HE, as elsewhere, is facing unprecedented challenges due to different reasons (see problem statement). Both extremes (opportunities and challenges) have catalyzed HES to undergo substantial changes and transformations impacting global, regional, national, and local contexts; some have created new opportunities while others have generated new challenges. HE is learning, teaching, research, and services are, therefore, affected by the physical and psychosocial effects of these and the demands of the day. So, it is a survival strategy to stand answerable to the demands of the day by delivering transformative outcomes- revitalizing the ways of knowledge creation, preservation, dissemination, extension, application, and innovation, cognizant of global and local circumstances.

There are major rationales that motivated HEIs to do reform initiatives. HEIS are currently under pressure to withstand the effects of technology, globalization and competition. Whereas technology influences the functioning of institutions in the marketplace and reshapes pedagogy and teaching, globalization allows the free flow of ideas, capital, people, goods around the world- implying aftermath effects on identity and culture (Fägerlind, & Strömqvist, 2004).

As Salim (2009: ix) indicates "…the World Bank sought policy developments and innovations to encourage reforms leading to greater access, equity, relevance, and quality in national tertiary education systems". In line with this and as part of the survival mechanism, many of our universities including those in Ethiopia have introduced various reforms. These reforms have changed the way the universities' activities are organized, how services are provided and the way institutions are managed. This process of change is referred to as 'institutional restructuring'. Institutional restructuring has become a survival strategy to improve the relevance of courses or to enhance quality. The survival question of the universities' system has required a painful restructuring. It deals with changes in both governance and institutional management.

Whereas the word *governance* denotes decision-making structures and processes (both the structure and process of authoritative decision making across issues that are significant for external as well as internal stakeholders), *management* or *administration* focuses on the implementation of decisions, and *leadership* refers to the roles and processes through which individuals seek to influence the decisions (Gayle, Tewarie and White ,*2003,* cited in Firdissa, 2008:70; Varghese, 2009).

Taking and implementing decisions can entail creating new structures, specific criteria to allocate resources for various activities, the allotment of tasks to various groups and performance evaluation. Structure refers to offices, positions and formal roles within an organization. Criteria

refer to norms that form the basis for the distribution of responsibilities and resources to all lower-level units within an organization (Ibid).

The process of institutional restructuring implies applying efficiency parameters and accountability measures. Many universities have reorganized their activities in a cost-conscious corporate style, even though they remain within the public sector domain. This institutional restructuring process is the single most important change that has taken place in universities over the past decades. Despite once being considered as organizations that do not change, universities are now being transformed at a very fast rate (Varghese, *2009*).

The process of institutional restructuring has changed how institutions function, affecting various university groups differently. Some experts believe that the restructuring process has changed universities' mission for the worst, whereas others feel there was no alternative but to reform the system. Inasmuch as restructuring is becoming a survival strategy, a continuous process of bargaining and negotiating is significant in the process of restructuring efforts. Certain universities have been more successful than others in implementing these changes (Varghese, 200

With the purpose to achieve their mission, vision and goals, many HEIs initiated (institutional) reform measures; mainly as a survival strategy including: 1) fund allocation rearrangement; 2) introducing student fees/cost-sharing measures and/or cost-recovery mechanisms; 3) establishing comparable structures to interact with universities abroad; 4) introducing new courses; 5) changes in admissions policies; 6) introducing a credit-based assessment system (ECTS); 7) espousing for institutional autonomy (for instance, AAU in Ethiopia) by moving away from government controls; and 8) creating new management structures (Firdissa, 2016; Shattock, 2004; Kitaev, 2004).

These inevitably have resulted in changing the curriculum, reorganizing courses and creating a unified structure and helped universities align themselves with institutions of higher education in other countries and in Europe and the Western world. Some universities have started exchanging programs and credit transfer systems (Firdissa, 2016). Along this, there are efforts to develop unified structures and evaluation systems that have helped to develop exchange programs throughout the world. The most important feature of the institutional restructuring process is that all the universities have created structures to provide better institutional management and decision-making processes. Decisions on the reorganization of faculties, on new courses and fees are made at the institutional level. Decision-making structures have become more democratic and decentralized (Firdissa, 2022, 2016).

Addis Ababa University had initiated different reform initiatives at different times including Business Process Reengineering (BPR) design initiative, which was nationally initiated in all sectors in Ethiopia during the early 21st century. Whereas the University achieved its intentions of the reforms, there, however, were several shortfalls to achieve the ideally acceptable reform initiatives (AAU, 2012 a, b; Firdissa, 2016).

Problem Statement

Though HEIs are optimistically engaged in any sort of reform initiatives, their landscape is both in enthusiasm, and worries. In the first place, our time is witnessing: 1) a renewed enthusiasm for higher education, research, and innovation; 2) accountability to taxpayers by adding values for the bucks and for the bungs- leading to authentic transformation; and 3) interconnectedness, globalization, and networked designs all catalyzing the role of HE for development. As a result,

the Global HE sector has well established processes and procedures for producing enlightened workforce, creating knowledge, and serving citizens.

Secondly, on the other hand, HER system is facing challenges that is also threatening the economy as well as mankind. Exacerbating the case, the fast-emerging technological advancement has brought both excitement and trepidations as they influence the HEIs' functions, implementations, opening new avenues for recruitment, student support, research collaboration, staff development, and teaching and learning resource development (CHE, 2015). HEIs are hassled with accelerated (technological and market) changes, globalization and increased competition, universality of business, scarcity of resources, a shift from industrialized to knowledge–based economy, image building, and achieving customer expectations. This calls for transformation of the HEIs' core mission, vision and values by going beyond the accustomed superficial reform wits, and taken for granted orthodoxy routines (CHE, 2015).

Whereas HE is expected to be a catalyst of societal transformation, "key constituencies and interest groups in our society are persistently arguing that higher education is not fulfilling these purposes and might in instances be a conservative force reproducing the status quo" CHE, 2015:2). Notwithstanding the Ethiopian Government's commitment to legislate, invest and expand the HES, there are issues of concern-some of which have existed long, whereas others have never been predicted until their happenings. A closer scrutiny of the Ethiopian HES shows, it is facing unprecedented challenges due to: 1) unmatched resources to expansion endeavors; 2) poorly led diversification of provisions; 3) unled new modes of delivery; 4) unsubstantiated heterogeneous student bodies; 5) unpreparedness for the growing internationalization of higher education; 6) unpreparedness for research and innovation as leveraging knowledge production; 7) world market pressures; 7) grand and petty corruption, and rent seeking mind-sets; and 8) economic turmoil; governance risks; unpredictability, turbulence, and consequent crises threatening mankind (Firdissa, 2022).

Understandability, the rapid expansion of higher education has brought about declining quality at HEIs. Exacerbating the case, the country lacks instructional-led systemic and systematic handlings of the education sector. Equally, the efforts to reach the HES very close to nations, nationalities and peoples were benightedly led. Consequently, quality in Ethiopian HEIs has remained searching a black gold in a dark room. Practices show that emphasis and resources have been directed to quantitative gains by enrolling and graduating students with low or no concern for quality. Whereas quantitative gains can serve as surface symptoms, they cannot be bottom-lines and sine qua non for the aspired development. Equally, there is lose management commitment to quality initiatives because many leaders are busy in political commitments, not in quality assurance matters; and fire- fighting- 80% of quality initiatives fail in the first two years, mainly because of lack of senior management backing and commitment (Firdissa, 2022).

These all enfeebled our HES' readiness to overcome Pressures, such as: 1) accelerated changes in business environment, 2) increased competition, 3) universality of business, 4) technological changes, 5) scarcity of resources, 6) shift from industrialized to knowledge–based societies, and 7) instability in the markets, and unpredictability in the politics- limiting HES' contributions to the development endeavors to the required level.

Consequently, many HEIS are experiencing declining enrollment, watched expenses outpace revenues and tapped into their endowments to cover shortfalls. The COVID-19 pandemic has exacerbated the pressures that higher-education institutions face (Bogg et al., 2021). The current

landscape of HES demands that we cannot continue business as usual in knowledge production, preservation, application, and use. The HES reform has become a common day agendum all over the world. There are different rationales for HES reform. There, however, are challenges to transform HES along with their functions. In some countries "the political and administrative ranks are utterly unprepared to assume their new role of providing sound and consistent guidance and strategic orientation regarding the longer-term goals and directions in national higher education and science policies" (Hénard, 2010: 43-44, citing Fried, 2006).

Overall, the Ethiopian HES as a whole and HEIs are currently under pressure with environmental accelerated changes and instability, increased competition, universality of business, technological changes, scarcity of resources, shift from industrialized to knowledge–based societies, achieving customer expectations, image, effects of technology, globalization and competition, and the need for volition and accountability. This in turn calls for discerning HEIs' reform rationales, reasons for failures, and devising ways of transforming the HEIs beyond shortfalls.

Objectives of the study

The study intended to achieve the following three objectives:

1) *To assess HES reform initiatives and their rationales,*
2) To investigate the whys and wherefores of HES reform failures, and
3) *To identify feasible ways of transforming HE system.*

Inherent within these objectives are the quests for transforming the Ethiopian HES beyond the hitherto piecemeal reform initiatives. To achieve the objectives, the study raised and answered three questions such as 1) What are the HES reform initiatives and their rationales? 2) Why did many HES reform initiatives fail? 2) What are the feasible ways of transforming the HES?

Methodology

The study relied upon a qualitative approach by reviewing existing literature to examine HEIs reform initiatives, their rationales and failures, and devising ways of transforming the HE system. This then was corroborated by interviews conducted with 5 purposely selected professionals (3 from Addis Ababa University, and 2 from the Ministry of Education). Whereas the data from existing literature were used to guide making inferences concerning the current study, the data-obtained from the interviews have been interspersed along the review results, leading to conclusions and driving implications for public sector transformation.

In the journey of the study, efforts were made to protect the identities of the participants by using codes, and by maintaining anonymity of the data sources, both of which align with many ethical practices in researching Higher Education in the Ethiopian context. The coding used to protect the identity of the interviewees has been shown in Table 1.

Table 1: Coding of the Interviewees

Interviewee:	Code	Place of work
One	Int1	AAU
Two	Int2	AAU
Three	Int3	AAU
Four	Int4	MOE, ETA
Five	Int5	MOE, head office

Interviewee

Reviewing existing literature and the interviews were guided by three questions such as 1) What are the HES reform initiatives and their rationales? 2) Why did many HES reform initiatives fail? 2) What are the possible ways of transforming the HE system?

Results and Discussions

The results are discussed under the three themes: the HES reform initiatives and their rationales, the whys and wherefores of the HES reform failures; and feasible ways of transforming the HES.

HES Reform initiatives and Rationales

The HES is currently under pressure with accelerated changes and instability, increased competition, universality of business, technological changes, scarcity of resources, shift from industrialized to knowledge–based economy, achieving customer expectations, image building, effects of technology, demands of globalization and internationalization. To overcome such pressures and to sustain their survival mechanism, many universities including those in Ethiopia introduced various reform initiatives at different times. The survival question of the HE system has required them to go through reforms, because of which some HEIs have changed the way their activities were organized, how their services were provided and the way they were managed.

Document scrutiny and interviews have shown that many of the changes in some HEIs were just focused on receiving orders from the top and implementing them in most cases by restructuring academic units, creating new organograms, mobilizing resources, and focusing on excessive communications. Some HEIs also initiated reforms along new technologies and to meet the demands for globalization. This is because, the HEIs' functioning in the marketplace is influenced; their teaching-learning, research, and services delivery are reshaped-by the emerging technology wherein globalization allows the free flow of ideas, capital, people, goods around the world-implying aftermath effects on the identities and cultures of the HEIs (Fägerlind & Strömqvist, 2004).

Along with their mandates and expectations, HEIs also initiated reforms by give attention to the challenges, obstacles and affordances which might inhibit or enhance their capacities to fulfil their core functions – research, teaching and learning and social engagement (Cloete & Maasen, 2015, cited in CHE, 2015).

Different universities in Africa have introduced different reform measures at different times as a survival strategy. Many of the change initiatives were, nonetheless, driven from top by government policies under total centralization of the systems, wherein political leaders are the main drivers (Huisman, Smolentseva, Froumin, 2018). Other than the politically driven initiatives, reforms were also initiated due to the demands of: 1) the knowledge economy, which demands high level competencies, skills and attitudes; development and the need for redress, the transformation of the basic part functions of the HEIs; and 2) producing critical, independent citizens and skilled and socially-committed graduates who would be capable of contributing to social and economic development of the nation (CHE, 2015, 2013; Ngara, 2003).

As Varghese (2016) indicates, the University of Ghana, for instance, had initiated reforms in 2010 that related to the governing structure of the university, primarily to overcome its own internal anomalies. For that purpose, a visitation panel was established to undertake and report the reform initiative. It had noticed that it was impossible to continue its business within the then existing

administrative structures along with the shortage of resources that occurred as a result of the decline in the economic fortunes of the country, which had caused: 1) decline in the quality of infrastructural development; 2) difficulty in retaining teaching staff; 3) decline in learning quality along with the increase in student numbers, from about 10,000 in 2000 to over 28,000 in 2006; 4) a decline in academic standards and general service delivery; and 5) examination malpractice during the 2004/05 academic year (COL, 2007, cited in Varghese, 2016).

The same source further indicates that upon receipt of the visitation panel's report, the Council of the University discussed it at different stages and with pertinent stakeholders and decided: 1) that the committee structure was required for the functioning of the council; 2) to replace the existing Executive Committee of the Academic Board with an enlarged Business and Executive Committee to deal expeditiously with the Business of the Academic Board; and 3) on matters of discipline, the system of ad hoc disciplinary committee was replaced with standing disciplinary committee with executive powers to impose sanctions.

Some of the recommendations of the panel, nonetheless, required an amendment of the University of Ghana Act as a public entity established by an act of parliament. The governance structure of the University was considered a key factor in any reform exercise, among other considerations. A memorandum was, therefore, proposed a new council system with the purpose of modifying the role and composition of the University Council, restructuring and reorganizing the existing dysfunctional organizational structure by expanding the membership of the Council from fifteen to over twenty members. This is to enable it to play an effective role as the governing body of the University (Ghana, 2010).

In the same vein, some of the Ethiopian HEIs had introduced various reforms as part of the survival mechanism by overcoming their state of hopeless pride, status quo, quantitative targets/gains, ad hoc and rubber stumping decisions, and institutional fatigue (Int2). Two of the interviewees (Int1 & 3) also indicated that there were several rationales for the HEIs' reform initiatives specifically in the Ethiopian context. Common from the rationales were to overcome challenges, and to achieve the HEIs' aspirations to be centers of excellence in teaching, research, and services delivery by applying efficiency parameters and accountability measures.

For instance, AAU had introduced many important reform initiatives at different times. In stating the rationales for its reform initiatives, AAU aspired to be a center of excellence by:

> …advancing relevant, innovative and creative teaching, research and community services - responsive to national and international demands, while fostering and ensuring democratic values, equity, diversity, and robust exercise of academic freedom; developing and nurturing vibrant programs, professional competence, a humanistic education, a scientific culture; and producing critically committed and ethically strong citizens (AAU, 2015).

It had also been making tireless efforts to make its functions meet international standards in the provision of high-quality teaching, learning, research and services (AAU, 2015). Consequently, there were various long- and short-term reform initiatives aimed, particularly, at the improvement of the quality of its functions along with its mandates and expectations of the different stakeholders. Some of the initiatives at AAU were: Business Process Re-engineering (BPR), General Education Quality Improvement Program Project (GEQUIP), Balanced Scorecard (BSC), Continuous Professional Development (CPD) initiatives, Modular curricula development and implementation, pedagogical reform that would both support students from diverse backgrounds

and prepare them for the challenges of the global economy and eventually to enable them to be responsible citizenship.

Regarding these initiatives, Int1 indicated that the University had the hope that its graduates would be equipped with saleable competencies, and that the University could make the highest possible contribution to students/graduates in various forms including programs that promote graduates' successful integration into the world of work, the world of life, and that would enable them to make meaningful contributions to the country's development. Efforts were made to make changes to bring a new model of teaching and learning, research and work-integrated learning, focus on learning as the primary outcome of education, assessment as a priority to measuring student success and institutional effectiveness, and developmental education (AAU, 2015).

Specifically, the 2012 AAU's reform was due to the observed deficiencies within the previous reforms initiative, mainly the Business Process Reengineering (BPR) design that had been put in place as of June 2009. The University sought to reinitiated another reform as it had witnessed some shortcomings in its governance that had put the daily business of the University in a limbo due to: multiple tiers of hierarchy, lack of clarity of roles, inefficient and backward system of the administrative and support services, department level anomalies and lack of empowerment, fragmentation of end-to-end processes, and many more (AAU, 2012 a, b). In addition to being rational to begin new reform, these were also reasons for reform initiative failures as they were learnt from failed reform initiatives at AAU.

Int2 also had the view that HEIs in our country enter any sort of reform to fulfill the diverse stakeholders' expectations by overcoming their status quo and conservativeness. Some HEIs strive even to the extent of going beneath the surface, and engaging in transformation, though they end in vain due to the challenges explained in 2.2 of this paper.

The whys and wherefores of HES Reform Failures

While reform initiatives have brought incremental alterations of the HES landscape, and quantitative increments in institutions, staff, student, and leadership in Ethiopia, as is the case in many African countries; they, nonetheless, haven't brought sustainable and vibrant transformations demanded in today's knowledge economy. The issue can be seen by citing the cases of different countries including that of Ethiopia with special focus on AAU's initiatives. For instance, while the HE sectors in South Africa "is profoundly different from the apartheid inheritance, it has some distance to travel before it can be declared that the imbalances of [their] past legacy have been eradicated, and that transformation goals have been fully achieved" (CHE, 2015:2).

Ethiopian the HES also tried to put in place different reform initiatives. It, nonetheless, failed to excel along with its mandates, expectations and the dynamisms. The accustomed reform initiatives have not enabled the Ethiopian HES to get out of its numerous challenges. The challenges are mainly related to governance that initiates the reforms top-down. For instance, the AAU's reform processes in most cases had been halted due to lose accountability and momentum, lack of instructional leadership, and unengaged and less empowered leadership- resulting in lack of shared vision, empowerment, ownership, commitment, and transparent and objective decision-making process (Int4). In the same vein, Int5 indicated that the failures of the hitherto reform initiatives at many of the universities, and mainly at AAU could be attributed to loose accountability, dogmatic institutional culture and deep-rooted status-quo, ad hoc and rubber stumping decisions,

fragmentations, institutional fatigue, uninvolved mind-set/indecisiveness, loose alignment of financial outcomes to the core mission, and overly communication beyond achievements.

Int1 also indicated that reform initiatives in Ethiopia failed due to: “lack of accountability, top-down initiatives, lack of ownership by the respective HEIs’ communities, piecemeal initiatives, just changing surface symptoms, with no depth and groundedness". Particularly, no one was accountable for any failed reform initiatives as things were pushed down from the top. This portends that there was a wobbly line of accountability to the taxpayers by adding values for the bucks and for the bungs that could lead to authentic transformation of the HES.

Lack of instructional leadership had resulted in failures to produce implementable planning and poorly implemented whatever planned activities and consequently affected sustainability of piecemeal change initiatives. For instance, the new structural set-up and governance system of AAU, which had been put in place as of June 2009 following the BPR design failed before implementation. The University found itself in a situation where it could not achieve efficiency, effectiveness, quality, flexibility, customer-centeredness, and responsiveness. Several challenges limited the University with the: deep-rooted status-quo and established ways of doing the business. Among others, the University had identified challenges such as: 1) lengthy and multiple chains of command, diffusion of responsibilities, and fragmented decision making practices; 2) omission of some designed work processes and inclusion of others not designed; 3) lack of clarity of roles; 4) inefficient and backward system of the administrative and support services; 5) department level anomalies and lack of empowerment; and 6) separation of outreach and university-industry partnership from research (AAU, 2012 a, b). These challenges were also rational to initiate still another reform initiative as indicated under 2.1 of this paper.

In short, lack of readiness for change among the University community, inadequate IT support, lack of capacity to properly allocate and utilize budget have been the limiting factors to fully implement the BPR design. Overall, the reform introduced in the system lacked efficiency and adequate capacity. There were also inadequate structural alignment/relocation failing to do away with the backward work cultures, lengthy and multiple chains of commands, and diffusion of responsibilities.

Discussions made with Int3, Int4 and Int5 along with the document reviews have also given that there were different reasons for the failures of reform initiatives: 1) Lack of instructional and authentically engaged leadership-not owning and supporting reform initiatives, 2) lack of flexibility; 3) loose resilience; 4) lack of depth, intensity, and inclusiveness; 5) rubber stamping sort of governing board; 6) lack of appropriate data; 7) not involving all communities of the institution; 8) lack of aligning budget allocation with the he mission; 9) overly and ineffective communication; 10) lack of capacity building strategies and actions; 11) lack of coherence, and 12) low communality of purpose among different stakeholders.

As learnt from document review and from the interviews, the much top-down acclaimed initiatives lacked clarity, specificity to the respective HEI environment. For instance, the BPR design at AAU lacked clarity of line of accountability, alignment with stakeholders’ expectations, and a well-defined overall work plan which could be easy for anyone to follow during the Phase of its implementation. This shows that the top-down initiatives to reform Ethiopian HES were more centrally driven and failed in most cases, and did not add value to enhance the HEIs’ functions.

As the World Bank report indicates, the top-down exercise of state authority in the governance of African universities did not improve their quality, as they were

> …not always done in support of quality. Indeed, in some cases, the increased role of the state in university education contributed to a decline in the quality of higher education as a desire for political control of education; appointments to management and governing bodies were made largely on political rather than on merit basis. (Materu, 2007 p. xvi, cited in Varghese, 2015:75).

Int5 also had the view that the reform efforts in Ethiopian HEIs were in most cases fixations of the existing system rather than basing on the very assumptions and functions of the HEIs. In relation to this, Keiffenheim (2022:2) indicates that many reforms failed since they focused on changing "the visible, lower-leverage elements of a HE system (resource flows, regulations, metrics) without changing the invisible factors such as the purpose (mind-sets, goals, beliefs, and values), and without considering the interrelations of system components".

Int4 also indicated that some of the reforms were on singular elements, quantitative, and physical issues like facilities, learning and teaching materials, instructors' recruitment and training. These, nonetheless, were just surface symptoms, and did not lead to system thinking. A lack of system thinking often leads to false consciousness about the cause (Keiffenheim, 2022).

As the same source (p.2) further indicates, HE Programmes that fix singular elements might improve some learning outcomes, but without considering the wider system, they are likely doomed to fail. In the Ethiopian context, the practices of reform rely on tackling individual problems, such as trying to improve administrative setup, updating curricula, reworking bylaws, training staff, and fulfilling infrastructure along with GEQUIP, BPR, BSC, etc. none of which produced sustainable fruits. Int1 also had the view that the Ethiopian HES was, in most cases, full of unfit, uncommitted, unmotivated, and unenlightened workforce and leaders who hardly contribute to the success of reform initiatives. Unsuccessful reform initiatives in Ethiopian context have resulted in undifferentiated degrees across universities, lack of empowering universities, mushrooming hopeless, quantitative targets/gains at the expense of quality, harmonization of core programs disregarding the uniqueness of HE environments, and assigning students to where and what they wouldn't like to, and focusing on excessively communication rather than systematic implementation.

Feasible ways of transforming the HE system

There are pragmatic ways of transforming the HES following realistic approaches that enable HEIs to operate flexibly and resiliently in the long term, to move to sustainable/lasting system change, not to misuse reform to delay transformation, to increase accountability, to tackle new challenges, ensure productivity and wise management, to protect consumers/clients/stakeholders, and to establishing quality culture at the HEIs.

Int2 indicated that one way of transforming the HES is by going" … beyond surface level, piecemeal and top-down reform initiatives, which are more of fixations of the existing system in Ethiopian context". HEIs are expected to tackle periodic and piecemeal top-down initiatives, short-term runs, narrow goals, and politically motivated reform initiatives that do not warranty long-term makeover of the HES as they are just small part of the problem, i.e. "the tip of the iceberg" (Keiffenheim, 2022:1).

Transforming the HES also demands of the HEIs to operate flexibly and resiliently, and to emerge on a stronger footing from obstructions and moving to sustainable system change (Bogg et al., 2021). Keiffenheim (2022:2) has also argued that "[e]ducation transformation that leads to

sustainable system change (not a better candle[6], but a light bulb) needs to understand, address, and be coherent about the system's structures". Though both reform and transformation are needed, "we can't misuse reform to delay transformation. Instead, we must collectively co-define and build upon new purpose(s) for education while improving the existing system" (Ibid).

For Bogg et al. (2021:3), a transformation which brings a lasting change "requires an intense, operations-wide program focused on improving student outcomes and boosting organizational health and performance". Based on their experiences, Bogg et al. (2021:5) have identified "five common features of the most successful transformation efforts", namely, ensuring and building leadership engagement, board prioritization of transformation, financial outcomes' alignment with the institution's mission, comprehensive approach, and muscle for change. These are not only transformation efforts, but also inspiring, proving and are essential for the long-term success of the HEIs involved themselves.

Related to these, Int1 had the view that active leadership engagement, empowerment, commitment, and ownership of the change agendas are crucial for HEIs' successes in their transformation endeavors. In underscoring the importance of ensuring leadership engagement and empowerment to support the organization to reach its full potential, Bogg et al. (2021:5) indicate that: "[t]he best predictor of the success of a transformation is leadership that is willing to embrace new and innovative approaches, recognizes the importance of institutional performance and health, and is prepared to take a self-confident leap instead of incremental steps. A few actions can help core decision makers ensure leadership is on board".

In further detailing leadership engagement and empowerment to support the organization to reach its full potential, it is advisable: 1) to develop an aspirational shared vision; 2) to establish a data-driven organizational baseline; 3) to create a sense of urgency; and 4) getting everyone involved (Bogg et al., 2021).

In highlighting the importance of ensuring the board's prioritization of the transformation Bogg et al. (2021) advise that the core decision makers should consider involving the board in three ways, namely: 1) leveraging the board's advisory/governing role and fiduciary duties; 2) building in accountability; and 3) ensuring the board is grounded in the current HE trends.

Bogg et al. (2021:8) further espouses for translating "financial outcomes to the institution's mission when setting transformation targets" by taking two related actions, namely, 1) emphasizing mission impact over fiscal impact in messaging to the campus, and 2) communicating small but impactful vignettes.

Moreover, in promoting the view that taking a comprehensive approach across both growth and efficiencies, Bogg et al. (2021:10) further indicate that "… targeting strategic growth can expand the impact of an institution's mission and establish a more financially resilient university" by way of: 1) reviewing student outcomes and revenue generating and operating activities, and 2) ensuring the message to the community focuses on strategic growth ambitions as well as efficiency.

Finally, in accentuating the need for building "muscle for change", Bogg et al. (2021:7) espouse for: 1) establishing a central transformation team; 2) detailing a transparent and objective decision-making process, and 3) improving organizational capabilities: invest in growing individual and

[6] *"A candle does not become a light bulb through many small improvements" (Keiffenheim, 2022: 1, citing Dr. Teresa Torzicky, from the Innovation Foundation for Education).*

collective capacity through dedicated training aimed at expanding the talent bench and ensuring the longevity of the transformation.

Above all, success in HE transformation demands ensuring proper governance, which encompasses multiple traits and complex webs as it moves between aspects of institutions, actors who are individuals and groups, localities and discourses (Othman, & Mukandala, 1994, cited in Igweta, et al., 2022). A thorough understanding of governance, therefore, calls for making distinctions among four complementary concepts: governance, management, administration, and leadership. Governance encompasses authoritative decision making structures, relationships, and process across issues that are significant for external as well as internal stakeholders; and has the attributes of accountability, influence and persuasive elements, responsibility, legitimacy, and democracy (Hénard & Mitterle, 2010:26-27, Gayle, Tewarie and White, 2003, cited in Firdissa, 2008: 70; Varghese, 2009; Temple et al., 2013; Igweta et al., 2022).

For Zgaga (2006), there are three interdependent levels of governance analysis: 1) internal or institutional governance of HES; 2) external or systemic governance of HES; and 3) international or global governance of HES within an international (global) perspective. Whereas management refers to the monitoring of institutional accountability and effectiveness; administration focuses on the implementation of procedures and/or decisions; and leadership refers to the strategic directions, the roles and processes through which individuals seek to influence the decisions (Gayle, Tewarie, & White, 2003, cited in Firdissa, 2008; Hénard & Mitterle, 2010).

In the Ethiopian context, university governance is run by the governing board, a President, vice presidents, etc. But the current trend following AAU's autonomy has brought positions of Chancellor [external], the vice-chancellor/ president or chief executive officers (CEOs), and deputy vice-chancellors, Deputy Vice-chancellors and many more. It might have been adopted from other countries. For instance, in Ghana, until the 1992 constitution prohibited it, the head of state was the de facto chancellor of public universities. Whereas the role of the Chancellor [external] is more of nominal, the president or chief executive officer or vice-chancellor is responsible for the day-to-day management of the university and hence is formally responsible for different administrative tasks. As these include the implementation of goals set out by the legislative authority or governing board, leadership and decision-making based on the strategic framework are necessary attributes for the top governance of HEIs.

An effective transformation demands going beneath the surface, and engaging in fundamental makeover, which questions the dominant logic of a system by revisiting its existing/current function/purpose of a specific HE from which everything else follows. HE system transformation should fit for the purpose the time demands. This calls for system transformation, a paradigm shifts rather than mere reform, which is in most cases piecemeal, incremental, repair, not transformative (Int5). There is a need to cause a fundamental change in the very purpose of the HES, approach or underlying educational assumptions by redefining and changing the HES's shared purpose, or multiple purposes, that are fit for our time and context and then redesigning all system parts to contribute to these new purposes. This calls for focusing on system-level change that endures over time by: 1) redefining why the HEI exists (mission); 2) what it does to achieve its long term view (vision); 3) aligning with its culture and core priorities and beliefs that are shared among its stakeholders (values); 4) looking the future in a systematic manner (strategic planning); 5) demarcating where the HEI is now, and where it wants to be in the next five years; 6) visualizing how big the gap between where the HEI is and where it wants to be; 7) preparing resources required to get where it wants to be; 8) devising how it could arrive at its destination (its plans, programs,

projects, activities, etc.); and 9) evaluating the extent and/or whether it really arrives at its vision, mission and goals (Firdissa, 2008).

Our time calls for revealing, redefining, and changing the purpose of the HE system, which is often easier said than done. We should aim to change the invisible, the purpose- mindset, goals, beliefs, and values by considering the interrelations of system components, considering the wider system.

In implicating governance for the quality of education, Hénard and Mitterle (2010) have the view that linking quality assurance to governance roles enhances transformation of the HES with the purpose of: 1) increasing accountability, 2) tackling new challenges, 3) ensuring productivity and wise management, 4) protecting consumers/clients/stakeholders, 5) establishing quality as an appropriate state regulation.

Conclusions and Implications

With the quest of transforming the Ethiopian HES by investigating the hitherto reform rationales and their failures, a qualitative approach was used to generate data from document scrutiny and interviews. The fact that HEIs had introduced various reform initiatives to be centers of excellence along with their mandates, expectations, dynamisms, and to overcome challenges indicate that there are intuitive needs and rationales for that. Contrarily, nonetheless, many of the reforms failed before producing fruits due to unengaged and less empowered leadership- resulting in lack of shared vision, empowerment, ownership, commitment, and transparent and objective decision-making processes. Moreover, loose accountability, dogmatic institutional culture and deep-rooted status-quo, top-down and piecemeal reform initiatives, ad hoc and rubber stumping decisions, fragmentations, institutional fatigue, uninvolved mindset/indecisiveness, loose alignment of financial outcomes to the core mission, and overly communication beyond achievements were the reasons for reform failures and at the same time rationales to instigate still another reform. Consequently, many of the HEIs were menaced with abortive reform jumbles that cannot liberate the System from its quagmire of the inundated challenges and dogmatic cultures. In such a case, the HES can hardly transform public sectors to meet societal needs by providing better services, and by invigorating development endeavors along with the dynamisms. To transform the public sector, calls for first transforming the HES itself by going beyond the status quo and by doing different things along with the dynamisms.

The secretary-general of the UN, António Guterres, once asserted that "[w]e will not end this crisis by simply doing more of the same, faster or better. Now is the time to transform education systems" (UN, 202:2). In presumption, therefore, there is a need to tackle periodic and piecemeal top-down initiatives, short-term runs, narrow goals, and politically motivated reform initiatives that do not warranty long-term makeover of the HES as they are just small part of the problem, i.e. "the tip of the iceberg". This calls for going beyond fire fitting, going beneath the surface, transform the very assumption HES, building a culture of Indigenous Knowledge paradigm, and engaging in transformation, which questions the dominant logic of a system by revisiting its existing/current function/purpose of a specific HE from which everything else follows; and making the HE systems fit for the purpose of the public sectors and the demand of the day by paradigmatically transforming rather than focusing on mere reform, which is piecemeal, incremental, repair, not transformative.

To engage in public sector transformation, HEIs need to operate more compliantly, robustly and emerge on a sound foundation that relieves them from their predicament. This can be a reality

when they work on systemic transformation by: going beyond surface symptoms, focusing on strategic issues, considering dynamisms within the knowledge production and utilization, putting in place a culture of instructional leadership, instilling accountability, tackling emergent challenges, targeting productivity and managing it wisely, meeting stakeholders' expectations and protecting their interests, and making education quality part of the systemic and institutional strategic and transformative cultures.

Overall, the reform rationales include the HEIs' mandates, aspirations (commonly to be centers of excellence in their core functions), expectations; dynamisms, challenges; and failed previous reforms. The causes for reform failures also include top-down initiatives; accountability and momentum loose; lack of instructional and unengaged leadership; undesirable institutional culture; piecemeal/surface symptoms; nominal board assignment and culture; unaligned budget with mission; overly and ineffective communication; and just focus on the visible ignoring the invisibles (mindsets, goals, beliefs, and values). There are also ways of transforming the HES by aligning transformation initiatives to mandates, aspirations, expectations, and dynamisms; overcoming challenges, approaching systemically; transforming the very assumption of the HE curriculum; and building a culture of Indigenous Knowledge paradigm.

Finally, sustaining transformation calls for systemic and systematic transformative planning, implementation, monitoring and support; institutionalizing the HES transformation; enhancing ownership; instilling instructional leadership; and enforcing autonomy with accountability.

The interplays among the reform rationales, failures, and ways of HES transformation and sustaining it

Figure 1: Interplay among Reform rationales and Failures, and HES Transformation and Sustaining

As can be seen from Figure 1, reform failures were the major cause still for otform

As seen from the reform initiatives, and reform rationales also may affect reform failures positively or negatively. That is why there is a double arrow in between the rationales and the causes for failures. Whereas well planned and implemented reform rationales minimize the causes for the failures, the reverse is also true to aggravate the failures. On the other hand, the arrow between reform causes failure and the HES transformation is broken and yet with reciprocal influences as the causes downsize the extent of the HES Transformation and equally in opposite direction well done the HES Transformation minimizes the effects of the failures.

The arrow between the HES Transformation and sustaining the HES Transformation shows that there are equal and positive effects between the two. Whereas well planned and implemented HES Transformation guarantees sustaining HES Transformation, sustained HES Transformation also further transforms the HES along with the dynamisms. The transformed HES, therefore, should be sustained through systemic and systematic transformative planning, implementation, monitoring and supporting. The interplays among the variables call for 1) going beyond surface symptoms and causing a fundamental change in the very purposes, values, assumptions, and quality culture of the HES; 2) focusing on strategic issues, on mission, on vision, and on core values and considering their dynamisms along with time, space, environment, development, and unpredictability; and 3) putting in place systems thinking by visualizing and realizing the HES as a whole and its interactive constituent parts wherein public sector transformation is goof-proofed. The results imply that transforming the public sector calls for revitalizing the mind-sets and systemically transforming the very assumptions of the HES by:

1) Delivering transformative outcomes wherein research, teaching, and services are directed to societal needs.
2) linking the HES to regional development endeavours, cognizance of the current Ethiopian Federal arrangements.
3) Reconsidering the way governing Board, and students are assigned to universities.
4) Putting in place systemic and systematic strategies to guarantee the qualities of HE functions.
5) Boosting staff and leadership understanding and commitment towards transformation.
6) Building HES on a sound foundation of high-quality, equity, networking, and responsive to Indigenous knowledge systems, work, life, and labour market demands; and
7) Making HEIs agents of transformative changes owned by their communities.

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