Konso Indigenous Knowledge and Social Institutions: the Crux and Kernel of Environmental Adaptation

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Abstract

This article delves into the place and role of Indigenous Knowledge (IK) and social institutions in human environmental adaptation. It has explored how Konso social institutions shaped and sustained a culture of environmental adaptation in the face of natural and anthropogenic adversities. A qualitative research approach has been employed to carry out the research. Longitudinal observation, in-depth interviews, and focus group discussions constituted the major data-gathering tools, while 'Situated Learning Theory' provided an essential framework for exploring modes of knowledge acquisition and transmission. The study revealed that the Konso people have devised complex and mutually reinforcing indigenous institutions that prop up a culture of environmental adaptation. While efficient methods of labor organization ensured mobilization and coordination of the needed manpower to build terraces and water ponds, neighborhood and clan organizations, together with the "*Poqalla*" institution, have nurtured the youth to observe and uphold established norms, ancestral values, and work ethics. It was also found that in light of the demographic shift and socio-political changes that have transpired through time, Konso traditional environmental wisdom exhibited both resilience and exceptional dynamic agility. Embedded in and mediated by indigenous social institutions, skillful adaptation to environmental challenges has become the hallmark of Konso survival strategy.

Key Words: Indigenous Knowledge, Indigenous Institutions, Environmental Adaptation, Situated Learning, Post –development.

1. Introduction

Many indigenous communities, including the Konso, foster and maintain multifaceted and nuanced relationships between humans and the natural world. Because of their connection to the land and the heightened impacts that they experience from the physical environment, in many cases, indigenous communities introduce context-based strategies to cope with or adapt to natural adversities. To sustain life and livelihoods in an inconvenient

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topography, particularly where mountainous landscapes and rugged terrains constrain agricultural activities, and where climate-related complications such as extremely variable and erratic rainfall put strain on production systems, indigenous coping strategies play an indispensable role (Brooks and Adger, 2005).

In human–nature interaction, place-based indigenous institutions put into action strategies and technologies devised to influence nature or increase human adaptability (Portes and Smith 2010). They accomplish this task by mobilizing and organizing human energies as well as by providing normative frameworks that regulate human action and behavior. By enabling people to pull resources together and guiding collective actions, they create a reserve pool often dubbed *human capital*, the availability of which fosters strength in the face of adversities by reducing vulnerability and enhancing community resilience (see Ambron, 1989)**.** Local institutions, knowledge and values have enabled people to understand events and changes in their environment and adequately respond to them. They provide a crucial foundation for carving out community-based environmental adaptation measures and natural resource management. This way, indigenous people have sustained their ecosystem and livelihoods for millennia.

Konso people are well known for their baffling resilience and innovative strategies of adapting to and transforming the rugged topography, hilly slopes and stony landscape with limited precipitation to a livable environment that suits human needs (Hallpike, 1972; Ambron, 1989; Watson, 2009; Tesfaye, 2003, Shako, 2004, Frehiwot, 2013). Long before the emergence of modern climate change debates at the global level, the Konso people have developed indigenous knowledge systems and institutions that laid the foundation for human responses to environmental challenges. Their institutions were particularly poised to deal with the adverse impacts of physical environment on their production and livelihood systems (see Watson, 2009). The problem of soil erosion and fertility loss stemming from the hilly topography and rugged terrain were overcome by building dry stone terraces that played triple role of retaining moisture, maintaining soil fertility and minimizing erosion (Ambron, 1989). In a similar vein, the problem of water scarcity that emanate from limited rainfall and erratic precipitation has been mitigated by introducing multi-layered water harvesting schemes, which were used for small scale irrigation as well as provision of water for their livestock. However, the role of indigenous institutions that underpin Konso creativity and the development of indigenous knowledge of environmental adaptation

remained largely obscure. They didn't receive adequate attention commensurate to their significance in enhancing environmental adaptation.

Most studies conducted so far with regard to Konso people glossed over the role of their social institutions overwhelmingly preoccupied by the study of ethno-archaeological features, (see Kimura, 2002b; Frehiwot, 2013), exploration of ethno-linguistic traits or clan organization and inter-clan relationship (see Hallpike, 1972; Shako, 2004; Tadiwos, 2016), Indigenous knowledge practices in soil conservation (Yeshambel, 2013), Indigenous land management practices (Tamirat, 2014), Ethno-archaeological and archaeo-botanical studies of wild edible plants (Amesias, 2022), Continuity and change in traditional terracing and agricultural economy (Fikadu, 2023) and conservation challenges of World Heritage sites at Konso (Wannaw 2022). In addition to these, dry stone terracing, agricultural intensification and water conservation have grabbed the attention of pioneer scholars who painstakingly wrote on the people and culture under study. (see Hallpike, 1970; Ambron, 1989; Tesfaye, 2003; Watson, 2009).

Even in the budding literature of harnessing indigenous knowledge for development in Ethiopia, with the exception of the work of Watson (2009), the role of indigenous institutions in mobilizing and organizing human energies for creative action have received limited attention. Thus, drawing on Watson's work to a certain degree, and largely relying on the current researcher's three years of field work in Konso, this paper aims at illuminating the role and place of indigenous institutions in translating Konso indigenous knowledge into practical actions in their struggle to overcome environmental challenges and transform the difficult environment for human use. In this work, indigenous institutions were treated as the crux and kernel of environmental adaptation for they provided organizational foundation and normative frameworks on which the social organization of labor was anchored and strategies of adaptation were grounded. Correspondingly, the findings of the research presented herein focused on the roles of indigenous institutions in terrace making, water harvesting and construction of nucleated settlements as important tools of environmental adaptation.

2. Research Methods

Qualitative research approach has been employed to carry out this research. The approach was selected for several reasons. Primarily, it was chosen for a rich and in-depth understanding of the social and environmental context it provides. As aptly noted by Creswell (2009), qualitative approach enables

researchers to explore complex and nuanced topics, giving voice to experiences and perspectives of research participants. It also offers flexibility and contextual understanding. As the purpose of this research is to understand the role of Konso social organizations in forging culture of environmental adaptation, qualitative approach was used to grasp community perspectives and visualize physical structures put in place to deal with vagaries of nature and foster human adaptation. Among qualitative data gathering tools, physical observation, in-depth interview and focus group discussions were the major instruments employed while *Situated Learning Theory* provided essential framework to understand inter-generational culture learning and knowledge transmission.

The study was conducted between January 2021 and June 2023 with two field visits each year. Physical observations carried out during the six field seasons (each of which comprised two weeks field presence) have given the researcher an opportunity to crisscross the Konso land and see old and abandoned terrace fields (see Fig 1. below). Moreover, there were enduring and continuously functioning ones, in addition to terraced farm plots refurbished after long period of fallowing that I had a pleasure to observe (see Fig 2 & 3).

Fig. 1: Abandoned terrace fields (Source: Researcher's field photo)

Fig. 2: Terraced farm plot currently in use Fig. 3. Reused terrace plots


Source: Researcher's field photo

Series of interviews were made with purposely selected knowledgeable elders who were considered repository of Konso tradition and wisdom (See Fig. 4 below).

Fig. 4: Photo of two prominent interview respondents: A Konso clan leader *Kala* GEzahegn and respected knowledgeable elder Ato Korra Garra.


Young people (both High School and University graduates) were also interviewed to know their perception about Konso indigenous knowledge in comparison to scientific knowledge obtained in long years of formal schooling as well as their interest toward upholding ancestral traditions. Moreover, key informants from Konso Culture and Tourism Bureau were consulted on the role of preserving indigenous traditions for posterity and added economic value obtained after the inscription of Konso Cultural Landscape on UNESCO World Heritage List. Lastly, three Focus Group Discussions (FGDs) each of which comprised six discussants were conducted with people of different age and social backgrounds to ensure data triangulation (see Fig. 5).

Figure 5, FGD –one participants

Figure. 6, FGD –two participants

Figure.7. FGD –three participants with my PhD field collaborator

Empirical data collected through field observation and multilayered interviews were corroborated by secondary sources. Available written sources were meticulously reviewed to generate the required information. Of particular interest were academic works with particular focus on Konso people and their cultures. UNESCO world heritage nomination documents produced by ARCCH and UNESCO experts as a preliminary guide for the inscription of Konso Cultural landscape on the world heritage list and those produced in the aftermath of 2011 when Konso cultural landscape sought UNESCO recognition were also given due attention as they provided valuable insights pertaining to Konso indigenous innovations. Moreover, documents lodged in Konso Culture and Tourism Bureau were consulted to garner expert knowledge of officials managing cultural institutions of the Zone.

3. Conceptual and Theoretical Underpinning the Study

3.1.Conceptualizing Indigenous Knowledge (IK)

Knowledge production and acquisition are perhaps the most crucial features that distinguish human being in the whole world of living beings. Yet, the way humans produce or acquire knowledge is mediated by differing circumstances. Owing to such differences (albeit contentious), today knowledge is broadly categorized into indigenous and scientific/Western (fictitiously assumed global and objective). In this section, attempt is made to conceptualize "indigenous knowledge," which has emerged long before the development of modern science, but whose precise definition remains disputed to date. Perhaps because of the difficulty to ascribe the term "indigenous" to any specific category of people at will, scholars are still grappling with the difficulty to precisely define indigenous knowledge (IK) itself in a single word. Thus, IK lends itself to differing interpretations under different circumstances and from different perspectives. In what follows, therefore attempt was made to scrutinize contending conceptualizations and provide operational definition at least for this particular work.

Many scholars have contributed to a critical understanding of indigenous knowledge and its socio-cultural and environmental benefits (see Agrawal 1995a & b; Briggs and Sharp, 2004; Briggs, 2014). However, it has been interpreted in different ways by different scholars lending diverging meaning to the same concept: indigenous technical knowledge, traditional environmental knowledge, rural knowledge, local knowledge and farmer's or pastoralist's knowledge (Hoda Yacoub-IK Repot, n.d.). On top of that, as wisdom of the local people who are predominantly rural, technologically

backward, illiterate and dependent on subsistence economy, IK has been undervalued, and denigrated to use the words of Watson (2009) and even despised for a long period of time. It has endured a lot of criticism being characterized as: backward, irrational, trivial, parochial, and unproductive. This image of the knowledge has persisted particularly in development discourses. Since the advent of modernization theory, indigenous wisdom and traditions were considered a roadblock to development (See for instance the works of Learner, 1958; Parsons, T. 1951; and Eisenstadt, 1973). As aptly noted by Watson (2009:4), development was equated with a particular brand of modernization in which 'Western' scientific knowledge is championed to alleviate all soil ills. Yet, practice has shown that projects conceived by and applied with the help of such a modernist zeal have failed to produce the desired result (albeit modest improvements) and extricate underdeveloped societies from abject poverty.

Owing to such development failures and other environmental reasons, significant shift in understanding and evaluation of the role of IK has been observed towards the end of 1970s and beginning of 1980s (Gusfield, 1967; Escobar, 1995). Prompted by and fueled with emergent global ecological crisis that posed existential threat to humanity, the recent shift of attitude have resulted in rethinking of the role of indigenous knowledge particularly in biodiversity conservation and overcoming the impacts of climate change (see Brundtland, 1989). Moreover, the realization that causes of the current ecological crisis partly lie in the over exploitation of natural resources based on inappropriate attitudes and technologies as well as the recognition that indigenous people have managed the environments in which they have lived for generations, often without significantly damaging local ecology and thus their knowledge could be used as a solution to avert the looming crisis, have finally cemented the place of Indigenous Knowledge as a valuable wisdom to be reckoned with. Metaphorically speaking, the story of indigenous knowledge was a story of "a disease turned a cure" wherein a tradition previously considered the source of all underdevelopment ills, is now touted as a potent remedy for the same problem.

Today, IK occupies a reputable place particularly in the realm of sustainable development and environmental protection. It is understood as a local or traditional knowledge that indigenous people have brought down with them from earlier times and used to make a living in a particular environment (Warren, 1991). It represents a comprehensive knowledge which applies to all spheres of human life and well adapted to the requirements of local people and

conditions. As a body of knowledge built up by a group of people through generations of living in close contact with nature, holistic understanding of the interactions between ecosystems, biodiversity, and human well-being; it has gained world-wide recognition. Yet, the incongruence in its definition still abounds. Thus, to overcome the perplexing variation, the UNESCO definition is adopted in this work as a working definition. Accordingly, IK refers to "Undertakings, skills, and philosophies developed by local communities with long histories and experiences of interaction with their natural surroundings" (UNESCO, 1989).

By focusing on its general features, the above definition epitomizes IK as embodiment of the collective skills, understanding and philosophies of societies that have a long history of occupation and observation in interacting with the natural environment (see Fraser *et al*. 2006, Woodward *et al*. 2012). It is also possible to infer from the above definition that IK is closely interwoven with local religious beliefs, customs, folklore, and land-use practices, and that it plays an important role not only in sustainable natural resource management under conditions of rapid and sustained environmental change, but also in sustaining traditional culture and livelihoods.

3.2. Indigenous Institutions and Social Organizations.

Conceptualization of institution cuts across various academic disciplines. Owing to this, in this paper, attempt was made to capture a comprehensive assumption of institution straddling sociology and economics. At the same time, the perplexing confusion surrounding the relationship between the notions of *organization* and *intuition* has been scrutinized to unravel corresponding puzzles.

Sociologically speaking, institutions refer to a set of rules, norms, and organizations (structures) that guide and govern social behavior and relationships (Reed, 1992). In modern organizations, they serve as a symbolic blueprint by offering written rules governing relationships among role occupants, for instance, in a family, schools, and other major areas of social life: the polity, the economy, religion, communications, and leisure organizations (Portes, 2006). In traditional societies too, they provide organizational framework and normative guidance for varieties of purposes including environmental adaptation, decision-making, resource mobilization and allocation. According to North (1990) and Ostrom (1990), institutions manifest themselves in two ways: formal and informal. They both constrain and facilitate human action by putting in place permissive and restrictive rules

and structures. In modern organizations, by and large they facilitate cooperation and coordination, and help to reduce uncertainty and transaction costs. In North's classification, while formal institutions refer to written laws and regulations, informal institutions pertain to orally transmitted norms and customary practices akin to Konso indigenous institutions.

As such Indigenous Institutions refer to traditional governance, social organizations and cultural practices that have been developed over generations. They are rooted in the values, beliefs, and customs of local people and often reflect a deep connection to the land, community and belief systems. These institutions are shaped by the unique histories, and traditions of indigenous peoples, and play pivotal role in governing community relations and managing resources. They can also be referred to as conventional knowledge, regularized practices, customary rules and practices which are developed by local people in their direct and long-term interaction with the social and natural environment in which they live (Agrawal, 2010).

These institutions serve as instruments through which the rational control over and wise use of scarce resources such land and water could be realized and directed towards the achievement of communally shared goals. They constitute a social technology through which material and human resources could be effectively combined and geared towards ultimate goal of human environmental adaptation or its transformation. By offering shared norms and cognitive frameworks through which individual behavior could be routinely subjected to discipline and control, indigenous institutions facilitate collective engagement and accomplishment of collective tasks (Agrawal, 2010; Watson, 2003). This way they provided customary foundation through which labor was rationally mobilized to build terraces and construct water harvesting ponds in Konso polity.

Despite their simplicity in comparison to complex modern bureaucratic organizations, indigenous institutions play key roles as containers and mobilizers of material and human resources which provide the infrastructure of customary administration and regulation required for effective function of the social system (Portes and Smith, 2010). They hold and pump the vital resources or "human collective energies," the integration of which makes diverse age and sex categories to work as a symbiotic whole to accomplish diverse tasks that individual family members cannot achieve in isolation.

Akin to modern organizations, indigenous institutions provide two types of resources: manpower and tools for manual labor as well as authoritative resources entailed in religious ideologies. They also provide information that structure geographical space and social time for purposeful action. It is, therefore, their capacity to generate and deploy organizational power that makes them so central to both environmental adaptation and reproduction of the social system. The organizational and regulative power indigenous institutions generate and deploy through work schedules and division of labor for various social categories: age, occupational and sex categories, i.e., young, adult and the old; male and female as well as peasants and craft groups in the Konso case makes it possible to accumulate and manipulate indigenous knowledge about the physical and social world in such a way that the benefit of collective work could be maximized.

Indigenous or local Institutions are critical in effecting environmental and climate resilience in rural communities mainly because they: mediate between the individual and collective responses to environmental impacts and shape outcomes of adaptation; they structure the impacts and vulnerability to environmental change; and they govern access to key resources for adaptation (Agrawal, 2010). In the words of Agrawal, Local Institutions shape the nature and degree to which households respond either as individuals or collectively. As will be seen in the ensuing discussion, these institutions have significantly shaped Konso community responses to environmental challenges.

3.3. Social Organization

Social organization refers to pattern of relationships between and among individuals and social groups. From a social systems perspective, organizations are social units directed to the achievement of collective goals or fulfillment of institutional needs for the wider society or environment of which they are a constituent part (Reed, 1992:75-76). They are 'the grand device for transforming human irrationalities into rational behavior (Wolin, S. 1961: 380).

By providing the administrative structures and cultural mechanisms through which individual behavior could be automatically subjected to disciplined calculation and control, organizations establish the technical apparatus and cognitive foundations on which social life rests. From this perspective, an organization is a concrete manifestation of institutions with an identifiable location, personnel, and rule structure. In illustrating what organizations are and why they are needed. Ahrne (1990) writes:

> Organization is a struggle for control and order in confrontation with recalcitrant environment…It is a method of making human activities permanent in order to increase control over uncertain environments… Organizing occurs as a response to uncertain environments. It is a struggle against hostile surroundings … through its hierarchy, its rule, and its artifacts and symbols; an organization becomes an extra individual entity… Organizations are, to a large extent, engaged in activities whose aim is to influence and control the nearest environment (Ahrne, G. 1990:36-39).

Ahrne perceived organizations as a social landscape in which collective actors struggle to increase their control and ideological resources, and organizing eliminates uncertainty through rational control and coordination that it provides. Within the institutional framework, organizations achieve some degree of isomorphism with their institutional environment, that is, their structures come to imitate, resemble and perhaps even incorporate selected aspects of their cultural settings (Reed, 1992:175). This leads us to suggest that organizations are the product of cultural processes through which a reality is socially constructed and institutionally sustained in a sometimes hostile and threatening environment akin to Konso natural environment, which gave rise to the origin of vibrant social organizations that served as a vehicle for environmental adaptation and transformation.

4. Theoretical Foundations of this Study

This study is informed by and draws on two theories: Post-Development and Situated Learning Theories. What follows is, therefore, a brief description of the two theories.

4.1. Post-development Theory

Development theory is a frame of ideas and concepts that aim to explain and understand the process of development and attendant socio-economic transformation. As noted by Rist (2007), created by the West and adhered to by the Rest, development discourse has enormously influenced trajectories of non-Western societies thinking both in terms of selecting development pathways and relevant approaches. Since the end of the Second World War, this agenda has evolved through different stages, from its focus on economic growth, to growth with equity, then to basic needs, participatory development, and finally to sustainable development (Agrawal, 1995a). In this long journey, indigenous knowledge was initially rejected as irrelevant and sterile body of

human thought that contributes nothing to 'modernization. Following the failure of modernization project to produce the needed result, however, IK has emerged as a potent force that can shape not only development thinking, but also harnessed for development practice, particularly the sustainable one. Over the past decades it has gained recognition and has become a popular phrase in the rhetoric of development. More precisely, interest in indigenous knowledge gained popularity during the 1980s in response to dissatisfaction with modernization as a means of improving the standard of living among the rural poor population in the global south. This trend has been given more emphasis in post- development theory (see Escobar, A. 1995, 2012; Sachs, W. 1992; Kumar, A. 1998; Rist, G. 2007; and Ziai, A. 2007).

Post-development theory is a nascent perspective centered on redefining the concept of development and challenging the power dynamics as well as the binary-thinking inherent in the mainstream development model which categorizes societies into developed/underdeveloped, modern/traditional and West / Rest (Johnson, 2014). It challenges the traditional assumptions and approaches of development as top-down frame of reference that does not take into account local realities, and traditions. It criticizes the modernization theory of development as a universalistic, linear and progress oriented concept. Post-development theorists argue that progress and development professed by modernization theory has failed to extricate non-western societies from abject poverty due to its overbearing tendencies. As the entire concept and practice of development prescribed by modernization theory have become too steeped in an ideology of Western supremacy, and because it has moved development out of the hands of local communities, post-development theorists labeled it as Euro-centric prophecy devoid of contextual touch (Dada, 2016: 75).

Resonating the mounting spirit among the post-development scholars expressed above, here is what one of the ardent proponents of post-development scholarship, Arturo Escobar had to write; "the remaking of development must start by examining local constructions, to the extent that they are the life and history of the people, that is, the conditions of and for change" (Escobar, 1995: 98). From the view point of Briggs (2013: 127), Escobar's ideas highlight the relevance of the histories, geographies and socio-cultural constructions of local communities in understanding community level development, and importantly, to acknowledge indigenous knowledge as a valid body of knowledge and sources of creativity in the local context. In other words, the whole assumption of post-development is not about rejecting of

development *per se*, but about making the development process more participatory, context focused and embracive of local knowledge institutions.

As could be seen from the foregoing discussion, indigenous knowledge system, which has been silenced by modernization thinking and denigrated as irrelevant tool for development (see Watson, 2009), has been, resurrected form the dustbin of history by post- development theory, and now serves as a relevant body of knowledge that influences both development discourse and development practice. In this particular study, therefore, post-development theory is adopted for it acknowledges the role of local knowledge, traditional practices and indigenous wisdom for human survival and development in a local context. It is used to explain how indigenous knowledge can provide a possible alternative for the rural poor in their local environment. Its view of indigenous knowledge system as an alternative epistemology offers an understanding that there is a different way of knowing, perception and interacting within the world. This significantly departs from and challenges the dominant Western-centric scientific knowledge as the sole and legitimate source of knowledge in development process. Since the purpose of the current work was to show how indigenous knowledge and institutions grounded in them provide the necessary impetus for adapting to and transforming challenging environment to sustain life and reproduce oneself, post-development perspective offered strong theoretical foundation.

In post-development theory, indigenous knowledge is seen as embodiment of accumulated wisdom, skills, and practices of indigenous communities developed over generations to solve local problems thereby providing alternative development pathways. Particularly appreciated are traditional ecological knowledge of indigenous peoples, indigenous natural resource management, and biodiversity conservation. Intergenerational knowledge transfer and harmonious relationship with nature inherent in indigenous knowledge practices were also valued by proponents of post-development theory. In focusing on context specific and situational approach to development, post-development theory gives a critical lens through which one can question and reimagine development concepts and analyze the role of indigenous knowledge. This in turn offers an important vantage point to evaluate the role of Konso indigenous institution in fostering environmental adaptation.

In championing indigenous knowledge and traditional institutions as crux and kernel of Konso environmental adaptation, I was well aware of the limitations

of IK itself, particularly issues surrounding its contemporary relevance, susceptibility to loss or neglect due to intergenerational gap in knowledge transfer, and its capacity to sustain life in the face of shifting socio-demographic and economic situation. However, my study has shown that the Konso case is a little bit different. It exhibited that here indigenous knowledge is still vibrant in spite of many changes that have transpired over the ages. IK still occupies important place in the community life, particularly in maintaining dynamic equilibrium between man and nature as well as in providing sustainable means of livelihood while preserving the environment. This has been revealed during my field work in 2022 wherein the participants of FGD argued that despite adverse impact of the agents of modernity: urbanization, modern education, and livelihood changes prompted by emergent opportunities such as trade; majority of the youth still take pride of ancestral tradition. The inscription of Konso Cultural Landscape on the UNESCO World Heritage List has increased local youth's pride with ancestral tradition even more. Besides the rise in tourist flow to the region and increase in corresponding economic returns accrued thereof; interest towards terraced agriculture and environmental conservation is far from waning. Hitherto abandoned terrace field are being revitalized and used for cultivation as recently as May 2023 when I conducted my last field work.

4.2. Situated Learning Theory

Situated Learning Theory (SLT) is a cross disciplinary perspective shared by the fields of psychology, anthropology, cognitive science and sociology. Introduced by Jean Lave and Etienne Wenger in the 1990s, SLT emphasizes the importance of learning within a social and authentic context. The theory posits that learning occurs when individuals are actively engaged in real-life situations, interacting with others, and participating in meaningful activities (Lave, J., & Wenger, E. 1991). As such the theory is centered on explaining how learning or knowing is embedded within the socio-cultural context, and the environment of a community under investigation. It accentuates the idea that much of what is learned is specific to the situation or event in which it is learned (Vincini, 2003). Social and environmental situation or context in which one acquires knowledge, therefore, has a lasting mark on what is learned and the meaning attached thereof. Thus the proponents of Situated Learning Theory contend that knowledge must be learnt or acquired in a real context and not in abstraction devoid of contextual touch (see Vygotsky, 1978; Dewey, 1981; Lave, 1988; Lave and Wenger, 1991; Greeno *et al*. 1992). The theory examines learning as a fundamentally social phenomenon that occurs

throughout everyday interactions and mediated by social institutions. Knowledge is, thus produced by the social relations, cultural context, specific artifacts, and physical dimensions of the learning environment (Henning, 2008: 143).

The theory mainly emphasizes authentic and contextualized learning, communities of practices as well as apprenticeship and mentorship. It is closely connected with Social Learning Theory, which emphasizes observation and modeling in the learning process (see Albert Bandura, 1977). The connection between the two theories lies in their shared emphasis on the social aspect of learning. Both theories recognize the influence of social interaction on the acquisition of knowledge and skills.

Situated learning puts emphasis on practical, contextual and experiential learning, which represents the basic modes of indigenous knowledge acquisition. It values learning that is grounded in real-life experiences and context-specific. As much as indigenous knowledge is deeply embedded in the physical and cultural landscape of specific communities, situated learning underlines the role of context as a critical milieu for acquisition and preservation of such knowledge. From the perspective of SLT learning is not a detached and abstract process, but rather deeply intertwined with the learner's cultural and environmental setting.

Situated Learning Theory endeavors to portray the existing mismatch between the knowledge learned from school *vis-à-vis* the knowledge learned from day to day experiences. It postulates that learning process involves active participation as opposed to more passive methods often used in Western model without the involvement of local communities. From the vantage point of SLT, students are more predisposed to acquire knowledge by actively participating rather than simply listening to teachers (Lave, 1988: 9). This example illustrates that, a person learning indigenous knowledge is actively involved in addressing day to day community problems. Thus an individual learner becomes situated in the learning experience and knowledge acquisition becomes a part of the learning process as well as the culture from which the learning process evolved and is used (OTEC, 2007). The acquisition of indigenous knowledge thus includes daily interactions between people, culture, and environment. It is highly emphasized in situated learning that social interaction within the community is an important component since learners become actively involved in a community which utilizes the behavior and beliefs to be acquired (Lave, 1988).

SLT focuses on activities of daily living where learning occurs in social but informal settings. This view argues that learning transpires through social relationships, within a cultural milieu by linking previous knowledge to present contexts (Lave and Wenger, 1991:14). It also emphasizes that learning should not be viewed as just a transmission of knowledge, but as a separate cognitive process. Such a method of learning is inspired by specific contexts (in which the learning is socially situated) and thereby particular physical environments (Lave, 1988). The process of learning indigenous knowledge is informal and usually occurs on a spontaneous basis whereby those who are learning are expected to learn by being a trainee in different community oriented activities (cf. 7.2). Survival often depends on the learning of indigenous knowledge in this context, thus, every person within the community has a social commitment to learn from the expertise of others so as to contribute to the survival of their family, tribe and community (Tiu, 2007). Concurrently Cajete argues that learning in an indigenous context is a communal social activity. The idea of learning as a communal activity implies that the learning process involved is situated learning because the situations, in which individuals learn, are embedded within cultural or social contexts (Cajete 1994: 20).

However, one has to bear in mind that situated learning is not only applicable to learning of indigenous knowledge. It can well be applied to modern scientific knowledge if the learning process conforms to the socio-cultural milieu of a community. As pointed out by Rogoff (1990), a learning process that considers the cultural context of learners is extremely vital for understanding the crux of socio-cultural life, because personal knowledge acquisition cannot be detached from the cultural setting of the learning. This means that learning processes can be successful only when learners are given the opportunity to co-participate with practitioners, and at the same time be integrated in all social activities that provide the basis for learning (Tiu, 2007: 30). As emphasized by Lave and Wenger (1991: 18), “co-participation enables people to gain access to modes of behavior, eventually developing skills adequate to certain kinds of performance”.

The theories presented above were used contextually depending on the reality they better explain and their capacity to inform the research direction. By and large, I used them to explain how Konso indigenous knowledge coupled with indigenous social institutions catalyzed human adaptation to difficult environments. Further moreover, they were employed to explain changes that transpired in Konso tradition as a result of growing scarcity, which was fueled

by rapidly bulging population. The effects of the incorporation of the Konso society into the wider Ethiopian polity, which exposed this society to a more dynamic change and engendered complex form of adaptation, were also explored using the two theories. This means that the purpose of the discussion about the nexus between indigenous knowledge and situated learning theory presented above is not to make a new contribution to the growing body of literature based on Konso experience, but to explain how social organizations and indigenous institutions carved out of indigenous knowledge helped Konso community to creatively manage, adapt to and transform the difficult terrain (rugged and hilly topography) and erratic precipitation to better serve human needs.

5. Data Presentation and Discussion:

5.1. Brief Overview of the Study Community and their Environment

Located between 5° 12′–5° 40 N and 37° 01′–37° 43′ E at about 50 kilometers south of Lake Chamo in a bend of the Sagan River in the Rift Valley of southern Ethiopia, Konso represents one of the administrative zones in the Southern Ethiopia Regional State pursuant to the current administrative arrangement (see the locational map below). According to the traditional agro-ecological zone (AEZ) classification, 80% of the Konso landscape is semiarid (Kolla), with elevations ranging from 500 to 1500 m, and 20% is sub-humid (Woynadega), with elevations ranging from 1500 to 2300 m (Sibilo Gashure *et al*, 2022).

The Zone is inhabited by the Konso people who belong to the East Cushitic language speaking stock of people (Hallpike, 1972). Within the broader Cushitic language family, the Konso have developed a distinct language of their own called *Affa Xhonsso* (Tadiwos, 2016; Frehiwot, 2013).

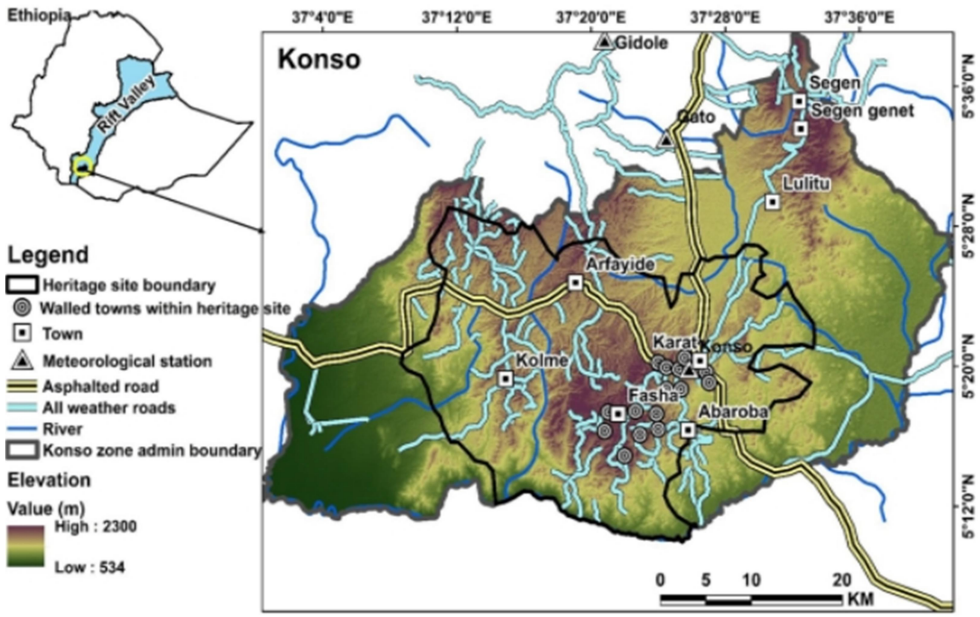

Fig. 8: Location map of Konso showing elevation, towns, meteorological stations, roads, rivers, and heritage sites. Adopted from Sibilo Gashure *et al* (2022).

The term 'Konso' stands both for the land, and the people (Hallpike, 1972). As to the origin of the Konso people, traditions suggest a complex pattern of migration into their present day homeland. Predominant emphasis, however, was put on migration of the Konso people from Liban area of the Borana land to their current residence. Konso myth of migration not only traces their easterly origin, but also closer cultural affinity with the neighboring Borana moiety of the Oromo ethnic group. This is corroborated by Hallpike's (1972) study, which asserts that the Konso share 44% of cognates with the Borana. Needless to say, oral traditions I have collected from elderly informants in July 2021 and December 2022, indicated that the Konso not only have cultural affinity, but also share common ancestry with the Borana. According to the informants, historically, the two communities have had common ritual site wherein *Gada ceremonies* were celebrated in unison and the Konso *Aba Gada* was accorded seniority in giving benediction.

The Konso inhabit a rugged, mountainous and rocky ecology separated by the Segen River from the current Borana Zone of the Oromia Regional State in the south. They also share borders with the Burji in the east, the Dirasha in the

north and the Amaro in the north east. The Konso Highlands run across the Rift Valley in an east-west direction and are situated in the dry belt of Ethiopia with an unreliable rainfall not exceeding 800 mm per year. The elevation of the area ranges between 1,500 and 2,000 meters above sea level. The climate is of a dry weather condition with temperatures ranging from below 15 °C at night to 32 °C during the day at the hottest time of the year (Joshua Project, n.d.).

Until 2011, Konso was a special Woreda within the Segen Area Peoples Zone of the Southern Nations, Nationalities and Peoples Regional (SNNPR). Following the dissolution of the Segen Area Peoples Zone in 2011, Konso emerged as independent Zone with its capital at Karat town. In the recently reorganized Southern Ethiopia Regional State too, it maintained a zonal status and now enjoys an autonomous administrative status like other zones in the Region.

5.2. Indigenous Strategies of Environmental Adaptation and Institutional Arrangements Augmenting the Adaptation Process

This section primarily provides a glimpse of major environmental adaptation strategies employed by Konso people to overcome challenges posed by rugged and hilly topography, erratic and limited precipitation. Among the various coping strategies developed by Konso people, terracing, water harvesting schemes, and construction of nucleated settlements were given due emphasis. Furthermore, indigenous institutions augmenting practical application and sustenance of indigenous technologies have been discussed succinctly to show how the interplay between indigenous technology and social institutions make environmental adaptation attainable.

5.2.1. Terracing as a Strategy and Innovative Technology for Environmental Adaptation

One of the most effective environmental adaptation strategy introduced by the Konso people was terrace making. It is not known as to when the terraces were built. Only local traditions suggest tentative dates by counting of the known power transfer ceremonies held every 18 years according to the Konso generation set social organization. Following such stories the beginning of terrace making in Konso is approximately dated back to four hundred years (Tesfaye, 2003). Over such a long span of time, intensively terraced landscapes were built between an altitude of 1500 and 2000 meters (ARCCH, 2009:7). These dry stone terraces enabled to prevent soil erosion; trap running

water and use it both for cultivation and moisture retention as well as creating saddle (bench like plain fields) on which varieties of crops were cultivated. In the face of a challenges posed by the hilly and rugged topography, shortage of plain land for extensive cultivation, and little precipitation, the Konso were forced to devise an innovative coping strategy. Interplay of community creativity and abundance of stone in the region helped to construct dry stone terraces and avert the possibility of further migration. According to Frehiwot (2013), the Konso have introduced three major types of terraces depending on the topography of the land. The following schematic sketch shows their morphology.

Type - 1 **Type - 2** **Type -3**

Fig. 9: Schematic sketch of Konso Terraces (Adopted from Frehiwot (2013).

As could be seen from the sketches, the first type is a dry stone construction laid down in rows horizontally along steeper hill slopes. It is meant both to check torrential erosion and create fertile saddle (cultivable space) on hillsides and encourage the formation of cultivable deep soil (Straube, 1967: 198 and Ambron, 1989). It is a predominant feature frequently seen around high terrain. The second type is a terrace built vertically by stone and soils between the upper and lower terraces to provide a good drainage, while the third type represents a terrace constructed on relatively lower areas by making a cut in the middle of a terrain (Frehiwot, 2013:24-25).

As noted by many (Hallpike, 1972; Amborn, 1998; Watson, 1998; Tesfaye 2003; Frehiwot, 2013), functionally, the Konso terraces served varieties of purposes: A) Agricultural: the primary purpose of the Konso terraces is for agriculture. They are carefully engineered to maximize water retention and soil fertility, allowing the Konso people to cultivate crops such as sorghum, maize, millet, beans and etc. ensuring food security for the community. B) Erosion control: the Konso terraces effectively control erosion on the hilly slopes. By creating series of stepped platforms, the terraces slow down water runoff, preventing soil erosion and maintaining fertility of the land. The terraces also help conserve moisture, making the most efficient use of limited

water resources in the region. C) Water management: the terraces in Konso are built with a system of interconnected channels and reservoirs designed to collect rainwater and distribute it evenly across the fields. This water management system ensures a steady water supply for crops even during periods of droughts. D) Cultural: the Konso terraces are not only agricultural structures but also hold cultural and societal importance. Being recognized by UNESCO as one of the world heritage sites, they terraces reflect the Konso people's traditional knowledge, social organization, and cooperative labor practices, reinforcing their cultural identity and sense of community. E) Aesthetic and tourism purposes: in addition to their special practical purposes, the Konso terraces also have aesthetic value and attract tourism. The intricate patterns and geometric shapes created by the terraces make them visually striking. Visitors appreciate the harmonious integration of human intervention with the natural landscape, providing an opportunity for cultural and ecological tourism.

In the words of Shako Otto, (2004), Konso terraces are brilliant adaptive responses to environmental challenges developed through long-standing interaction with nature. These landscapes were produced through the interaction of people with the environment, and by the interaction of people with people (Watson, 1998:14), because, it needs mobilization and social organization of labor without which it is difficult to accomplish such a gigantic work that dotes almost every hillsides of the Konso landmass. As aptly noted by Watson, despite their preference for private or lineage based entitlement to land, the Konso nonetheless, create communal labor pool to build terraced fields for cultivation, which afterwards are owned and used by individual farmers. It is, therefore, labor reciprocity that underpins Konso terrace making.

In a nutshell, the multifunctional nature of Konso terraces highlights their significance in sustaining livelihoods, preserving cultural heritage, and conserving the environment. These terraces exemplify not only the ingenuity and adaptability of indigenous knowledge to challenging environments, but also showcase the interplay between humans and their environment. And this interplay was mediated by traditional institutions which harnessed human energy to create a livable environment amidst difficult terrain.

Fig. 10: Glimpse of Konso Terraces. **(**Adopted from Firehiwot (2013) and ARCCH Dossier for Konso world heritage nomination (2009).

5.2.2. Indigenous Water Harvesting Technologies

The Konso have introduced an integrated practice of environmental adaptation, which combines two mutually reinforcing mechanisms: soil protection and water conservation (see Tesfaye, 2003, ARCCH, 2009). By employing terraces and water harvesting techniques they make their environment suitable for mixed agriculture that combines crop production and livestock rearing. Just like terrace making, the Konso are adept in harvesting water with the help of deep wells they dig in each village to overcome problems posed by the scarcity and erratic nature of the rainfall. The traditional water reservoirs (ponds) created by the Konso are called *Harta* in their vernacular language. *Hartas* are located in different places: within the forests, near the forests or in the landscape where the rain water could easily be trapped, at locations where the water cannot easily sink (ARCCH, 2009:39). These *Hartas* are made by the community to collect the rain water for cattle. They have walls that reach as high as 13m and attain a length of 60 meters. There are also smaller *Hartas*. They are constructed using carefully selected stones and lined with expert builders. As could be seen in the ensuing discussion, *Harta* construction and conservation is done collectively by all members of the community, residents of nucleated villages called '*Paleeta*' and sometimes by the active age group "*Xela*", which falls between 20-36 age ranges in Konso generation-set age classification (See Tesfaye, 2003:96). The galleys that are leading to the Harta are carefully cleaned and sometimes lined with stones to reduce the silt form getting in to the reservoir.

Fig. 11: Community conservation of Harda in Busso Paleta (Source: ARCCH, 2009).

As could be inferred from the foregoing discussion, the Konso integrated environmental adaptation strategies have created a unique landscape suited for intensive agriculture. In light of the limited arable land, the Konso introduced intensive land use wherein on the saddles of terraced land along the hill sides multiple cultivation techniques were employed including intercropping to enable growing varieties of crops at the same time and on the same farm plot. They also used of stationary barn system from which animal dung is regularly collected and dispersed on farm plots as a natural fertilizer ensuring soil fertility.

In general, as correctly noted by Hallpike (1972), Amborn (1998) and Watson (1998) combining irrigation and terracing technologies, the Konso successfully coped up with their hard topography (see fig below). This adaptive strategy enabled them to develop a sedentary livelihood system as compared to neighboring Borana pastoralist group.

Fig. 5: Integrated agricultural system of Konso where terracing, water conservation and agriculture proved to be mutually supportive and interdependent. Adopted from ARCCH (2009).

5.2.3. Nucleated Settlement Pattern (the *Paleetas*)

Unlike many rural areas in Ethiopia, the Konso live in densely populated towns built on hill tops leaving the rest of the land for cultivation. This settlement strategy spurred economical and wise use of spaces in the face of arable land scarcity. In other words, while the less convenient non-arable hill tops are used for human settlement, relatively gentle slopes lying below hill tops were used for cultivation (albeit with the help of terracing). Thus, I strongly argue that the construction of nucleated settlements in Konso is part of the environmental adaptation strategy developed by indigenous communities to maximize spatial use.

Fig. 6: Nucleated settlement patterns of the Konso people (Source**:** ARCCH Dossier for Konso world heritage nomination (2009).

As indicated in the ARCCH dossier for Konso world heritage nomination (2009:13) and visually observed during my field visits in 2022 and 2023, the Konso live in dry stone walled towns locally called *Paleeta* high on hill terrains selected for their strategic and defensive advantages. These towns are encircled by rounds of dry stone defensive walls often ranging between one and six circles. Metaphorically expressing about their strategic position, Hallpike (1974) writes"… they crown the summit of a hill or are built on a spur, so that the terrain falls away steeply on three sides, leaving only the level ground of the fourth to be especially heavily defended". The three steep sides are usually bordered by terrace farms. Access to the town is possible only through one side.

While the commanding location of *Paleetas* on hill tops suggests the defensive strategy underpinning their origin, I strongly argue that conscious land use considerations also underlie the motives of building nucleated settlements up hills. The need for efficient use of scarce land resources for various economic purposes including for reserving level grounds for agriculture and animal husbandry has been alluded to by the Konso elders during a group interview held on (2023). Moreover, the level ground which is left unsettled and

considered by Hallpike (1972) as a gateway, in reality had additional functions. A closer glance at this side of the *Paleetas* further suggested that it is indeed a carefully engineered land use strategy with far reaching implications. It was set aside not only as a gateway and agricultural land, but also as a potential corridor for future infrastructure development. This is attested by the fact that apart from using this side of the terrain for agricultural purposes, contemporary social and economic infrastructures such as schools, clinics, flour mills, churches and modern burials are operating along this side following traditional land use patterns.

Impressive internal designs of the Konso settlements where winding access roads and Cultural (public spaces) are meticulously designed to offer convenience for their dwellers add extra information about the interplay of the exceptional ingenuity and creativity of the Konso people and culture of environmental adaptation. Interestingly, the inner structure of Konso villages or *Paleetas* is carefully engineered to offer multifunctional services. Among them the most striking one is '*Mora', a* public assembly place and cultural performance site where the neighborhood gathering takes place to deliberate on matters of societal importance and enjoy cultural festivities and performances. As Ambron (1997: 382) puts it, in morras "... political negotiations are held, the harvest of a victory may be celebrated, rites of passage, sacrifices of the land are carried out, accused persons swear oaths that they have done no harm to the community, and if they have, cleansing ceremonies to maintain the social peace are carried out." Moreover, *Moras* serve as sites of cultivation and indoctrination of the new generation into Konso cultural values, rules and conventions.

5.3. The Role of Indigenous Institutions in Augmenting Environmental Adaptation.

As stated earlier, indigenous institutions provide the knowledge, organizational capacity, and work ethics that underpin the construction of terraces, water harvesting schemes and establishment of nucleated settlements both as livelihood systems and as means of adaptation to nature or the living environment. As noted by Kimura (2004), during the construction of terraces, a huge amount of labor has been mobilized by neighborhood and generation-set organizations with the blessing of religious leaders, particularly the *Poqallas* who give their benedictions for the communal work as dedication to human wellbeing, which goes in tune with their religious obligation to contribute to societal good.

As terrace making is a highly labor intensive venture, people from different age and social categories participate during construction of terraces and digging of water harvesting ponds including the youth, adults and even children and women by providing the needed raw materials for construction, particularly stones and soil (Frehiwot, 2013). Information gathered during the 2023 field season revealed that apart from the able participants of the communal labor mentioned above; the elderly (men and women) also partake in the activities through their motivational ingenuity expressed in boosting the work morale by initiating traditional work songs, cracking jokes and storytelling. In addition to this, food and drinks, particularly the infamous local drink called *Chaqqa* is provided by women, making the labor organization and management a multifaceted and collaborative process. On-field or on-job interaction mediated by songs and jokes along with food and drink served in the field, make the working atmosphere collegial, enjoyable and attractive. It also serves as a learning arena where the elderly transmit their knowledge and the youth are nurtured by ancestral tradition. This is what situated learning is in its actual sense.

Besides construction of new livelihood enhancement and environmental protection infrastructures, there was a dire need for continuous maintenance and upkeep of the vital infrastructures to ensure longevity of services and sustainability of the practice. This in turn required continuous reengagement, reorganization and redeployment of communal labor force making the process a built in survival and innovative strategy. As noticed by many researchers who studied Konso (Hallpike, 1972, Ambron, 1989, Tesfaye 2003 and Frehiwot, 2013), terraces were periodically reorganized as they endure damages inflicted by denudation emanating from erosion (torrential overflows) and over use, while water harvesting ponds endured siltation wherein soil sediments, especially mud and clay particles entering the wells create deposit at the bottom of the reservoir. As a result, there was a need to remove the deposit to enable the Pond retain the required amount of water reserve. This situation in its turn demands another cycle of labor deployment with attendant management system. It is during the dry season when the size of the pond water dwindles or when it dries altogether that proper conservation of the water ponds including clearing of the silt deposit, maintenance of the damaged walls and fencing activities take place (ARCCH, 2009). All these labor mobilizations, organizations and accomplishments are guided by core values on which the persuasive capacity of community and religious leaders, particularly the ingenuity of the *Poqalla* rested.

Such a continuous and unique interplay of land use innovation and labor management system kept alive Konso culture of environmental adaptation, which has been cherished by many including Hallpike who praised the greatest skill and neatness in workmanship displayed on Konso landscape. He wrote “Perhaps nowhere else in traditional Ethiopia has the hand of man so impressed itself on the landscape as in Konso” (1972: 21). In the same vein, Amborn (1989) emphatically expressed his appreciation saying, “the hands of man nowhere have so overwhelmed itself on the landscape in such an extra ordinary efficient use of available resource".

The extraordinary use of available resources expressed by Ambron is unthinkable without proper labor organization and efficient management of man power. As noted by Chambers (1994) elsewhere and seen during my field work in Konso in 2003, the institutional arrangements put in place in Konso have spurred mobilize of people from diverse age and social backgrounds that converged around construction of vital infrastructure. In this venture, even though all age groups have taken part, the *Xela*, a category of young people within the age range between 20 to 26 years old plaid an important role as capable labor forces actively participating in terrace construction and water harvesting schemes (see the fig below).

Fig. 12: Konso youth (Xela) on terrace and water pond construction (adopted from ARRCH Konso *World Heritage Nomination Dossier (2009).*

5.4. Changes in Konso Tradition of Environmental Adaptation

The whole gamut of innovative practices indicated above has worked perfectly and ensured smooth flow of life and environmental sustainability for generations. However, through time changes driven both by internal dynamics and external pressure began to alter the long-standing status quo. As a result, the traditional way of life and Konso polity began to exhibit steady fracture. Like in all societies, Konso traditional polity and its culture didn't escape the ominous power of change. Despite significant degree of continuity changes have been observed I various spheres of life. For instance, the nucleated settlements (Paleetas) of the Konso and their innovative land use patterns which offered wonderful survival strategies in the context of limited population and relative natural abundance, have begun to face difficulties with rapid population growth. Mounting population pressure and land overuse resulted in the declining of old farming systems. In the absence of structural transformation in Konso subsistence economy beyond land use intensification, it has become too difficult to ensure household food security. This has brought about a change in settlement pattern mainly in the form of out- migration whereby some people began to abandon the traditional walled towns and old terraced hill sides to move elsewhere in search of new spaces both for settlement and cultivation. As a result, new scattered settlements in low lying areas have begun to emerge.

There was also a shift in the mode of cultivating farm lands located in the lowland plains. Instead of hand tools, which were the dominant instruments for cultivation up on the terraced hill sides and mountain slopes, ox-driven plowshares are being harnessed just like in other parts of Ethiopia. Livelihood diversification trough combination of multiple professions, have also began to take hold. For instance, former peasants have started to supplement their income by engaging in handcraft works such as weaving creating-craftsmen in agriculture. Trade has also flourished along the medieval long distance-caravan routs that cut across Konso land as described by Kluckhohn (1962).

Through time, new urban centers have emerged outside traditional Paleetas (walled villages) thereby increasing the number of population earning their means of livelihood from off-farm activities. Such was the establishment of the current zonal capital, *Karat* and other new towns in the Konso land. Outmigration to distant lands and neighboring lowland areas is also on the rise. One of such migration and settlement of the Konso people in Burji Woreda along the newly formed *Kalelle Lake* has been observed during my

field visit in 2023. A new lake called *Kalelle*, which emerged in Burji as recently as 2007 has already become a point of attraction for many who have recently involved in irrigation farming in the area. These changes notwithstanding, adherence to tradition is still strong as realized during my interview with Konso youth in 2023, and old *Paleetas* still offer vibrant life exhibiting the coexistence of change and continuity. This means that conservationist and innovationist traditions are imbedded in Konso culture demonstrating that tradition and innovation are not polar opposites, but part of a continuum.

6. Conclusion

The current study revealed that indigenous peoples have the knowledge and practices needed for coping with environmental problems. Their knowledge presents a unique opportunity both in environmental stewarding and food production.

Moreover, indigenous people are found to be highly innovative in adopting new responses to emerging challenges through introduction of new skills and creative mode of human-nature interaction. The Konso experience explicitly revealed that environmental adaptation is uniquely human, yet is highly contingent upon the necessary social organization and institutional arrangements that are needed to mobilize human energy, skills, work ethics and values of adherence to collective norms to achieve intended goals. The Konso people have developed such time-tested ingenuity that fostered their adaptation to difficult terrain through long-term interaction with their environment. It was furthers concluded that the Konso people's adaptation strategies were shaped by several factors, yet, population number and land size represent the most salient ones. It was found that the saturation of the carrying capacity of the land significantly limits the capacity of the local population to further manipulate the natural resources. It also strains the capacity to innovate in the face of extreme scarcity and achieve the desired result. In light of this, occupational diversification and change in settlement pattern have given the Konso a leverage to ensure a sustainable life thus far. Concomitantly, abandoning of ancestral land in the form of out migration to look for alternatives is on the rise as a convenient option.

Despite all these developments, the current study does not suggest that the days of traditional terracing as adaptive strategy are over, and traditional ingenuity of the Konso people is waning. It only shows a nascent change within a continuing tradition and the interplay of the two. In my opinion, this

is a normal process, and by no means an indication of the declining worth of indigenous knowledge and vanishing role of indigenous institutions.

Finally, the author of this work is far from claiming to have produced an exhaustive work. Suggestions are due particularly to emerging trends with regard to dwindling interest towards and declining adherence to ancestral traditions of innovation from within. Moreover, in the face of climate-change induced difficulties, new forms of environmental adaptation strategies devised by the youth (if any) should be looked into by future studies to see the resilience of indigenous knowledge in the face of a rapidly changing socio-demographic environment

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