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TRANSFORMATION OF KONSO VERNACULAR HOUSES

MASTER'S THESIS

This thesis is submitted to the Ethiopian Institute of Architecture, Building Construction and City Development (EiABC) and to School of Graduate Studies of Addis Ababa University for partial fulfillment of all requirements of Master of Science in Housing and Sustainable Development.

BY

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February, **2015**

Addis Ababa

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TRANSFORMATION OF KONSO VERNACULAR HOUSES

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MASTER'S THESIS

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Declaration

I declare that, this thesis prepared for the partal fulfilment of the requirements for the degree of **Masters of Science in Housing and Sustainable Development** entitled **"Transformation of Konso Vernacular Houses"** is my original research work prepared independently by my own effort with the close advice and guidance of my adviser. I also declare that this thesis has not been presented in any university and all sources that I have used or quoted have been indicated and acknowledged by means of complete references.

Garedew Mengesha Weldekidan

Signature: ----------

Date :----------

Confirmation

Here with I state that Garedew Mengesha Weldekidan has carried out this research work on the topic entitled "Transformation of Konso Vernacular Houses" under my supervision and it is sufficient for submission for the partial fulfilment for the award of **MSc. Degree in Housing and Sustainable Development.**

Yonas Alemayehu Soressa

Signature: ----------

Date: ----------

This thesis is submitted to the Ethiopian Institute of Architecture, Building Construction and City Development (EiABC), the School of Graduate Studies of Addis Ababa University in Partial Fulfillment of the Requirements for the Degree of Master of Science in Housing and Sustainable Development.

TITLE OF THESIS: TRANSFORMATION OF KONSO VERNACULAR HOUSES

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Date: February, 2015

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ABSTRACT

Vernacular Architecture is about buildings that are built by available resources within a traditional technological context. It also refers to the workmanship of the indigenous housing experts and the dwellers. Vernacular houses are built to meet specific needs, accommodating the values, economies and ways of life of the cultures that produce them. Konso, the study area, is one of the Woredas of Southern Nations, Nationalities, and People Regional State (SNNPRS) in Ethiopia, is one of the areas in Ethiopia where vernacular architecture is practiced abundantly. Five walled villages have been identified in order to study the expressions of vernacular architecture in Konso. The general objective of the study is to analyze the characteristics and transformation of the original Konso vernacular houses. The study identifies the characteristics of Konso vernacular houses from the point of view of space, function and building material. Besides, the study indicates the reasons for transformation. The study employed case study method where the data collection tools were interviews, focused group discussions and personal observation. In doing so, the study took in to account two case areas found closer to and far from the woreda's town. The target groups were selected from different walled villages. The first case study was based on information from three walled villages, whereas the second case presents the data from two villages. And, the data gathered for the study was analyzed qualitatively using pictures, tables and maps. The analysis and findings clearly indicate that the Konso vernacular houses were transformed partially (including the hybrid type) and totally to the extent of bringing about new cultural dynamics that challenges old power relations in the society.

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Garedew Mengesha
February 2015

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LOCAL NAMES

Term	Meaning
Aba Timpa	Holder of the religious purposes and peace maker and administrator
Agita	One of the Konso vernacular housing characters has two floorlevel built in clan leaders residential compound.
Alletta	House
Arahita	A special storage house for steamed Meat, Butter and Honey.
Arima Poqolla	The stone setting chair only for *Poqullas.*
Arumma	Corcular stone
Aybetta	Vertical load bracing of the roof
Baletuma	Compound of the clan leader
Boqulla	Clan leader
Chaka	Konso local beer / Tella /
Daka Dirumma	The stone of manhood
Debo	Work in group /Communal working system /
Elfennota (Elphign)	One of the konso housing unit for husband and his wife sleeping purpose.
Engulla	The storage basket made from bamboo
Gada	Age based indigenous democratic administration system.
Garda	Father
Handuda	A new marred wife of a clan
Harra	Open space using as entrance (Door)
Hayeda	Smoked and dried red meat
Hella	Social organization of Konso based on age group
Kabema	Lower surface of thatched roof structure of Konso Vernacular houses
Kanotta	Initiation ceremony in the generation-grading system.
Kanta	The small section of walled village.
Kantayata	One of the nine clans of Konso
Kebele	Governmental administration office of
Kekisha	The upper most thatched roof structure of Konso house.
Kibetta	The compound of the homesteads.
Kossa	One of the konso housing units uses for storage of grain
Kudda	The elevated architectural space used for secrete storage function
Kuretta	House for food preparation (Kitchen)

Manna	The special housing unit used for mother to spend their *Cheka* and sleeping functional.
Marra	A flexible rope type local building material used for tilting wood,
Mashawdida	The top edge thatched roof cover make from break
Mokka	Traditional religious leaders
Morra	The communal open public space of Konso
Olahitta	Generation pole
Paffta (Magana)	The communal housing unit of konso located in communal open space (*Morra*)
Paletta	Stone wall village (fortified village)
Paphaha	Open space
Poqulla	Clan leader
Porshetta	A group of persons who were in change the percolation of compound of konso people.
Qorqoro Housee	Rectangular, totally transformed corrugated iron sheet roof covered individual Konso people house.
Qorqoro Paffta	*Rectangular*, totally transformed corrugated iron sheet covered Konso people house space for husband and wife.
Tikka	Residential compound or Homesteads.
Tudata	Storage space located at raised floor of *Reqa* Woreda.

CHAPTER ONE

INTRODUCTION

CHAPTER ONE

INTRODUCTION

1.1. MOTIVATION

I had an opportunity to visit the Konso special Woreda way before I was enrolled in the graduate program. During my visit, I saw differently constructed houses from the original ones emerging in several compounds of the Konso population. From the external facade, the original houses were differently built and very attractive. These vernacular houses fit in the architectural theory that recognizes their authors as experimental builders without the intervention of professional architects. The vernacular houses of Konso have several building characters and structural forms. They have also building elements that decorate both the interior and external parts of the vernacular houses pleasing the eye. During that visit, I was struck that some kind of transformation was going on. In this respect, given my longstanding interest to study the formation and purpose of the vernacular houses and their current transformation, I exploited this opportunity to describe and analyze indigenous Konso houses.

1.2. RELEVANCE

First and for most, the study is useful in that it clearly shows the characteristics of the original Konso vernacular houses. Documenting original Konso vernacular houses is useful to conserve the ideas of experimental builders which could easily vanish because of the current transformation. As the study also identifies the transformation types together with their consequences, making such a study could help us to prepare mechanisms how to conserve certain core elements from this vernacular architecture or incorporate them into modern design concepts.

1.3. RESEARCH APPROACH

It could be understood that the Konso vernacular houses are aged and tied to the culture of the society. They have their own cultural meanings and functions. They are also built by locally available materials. Transformation is a change on space, form and building materials. So, the Konso vernacular houses were assumed to show those kinds of changes. This study is therefore exploratory and descriptive.

1.4. SCOPE

The study focuses on the transformation of spaces of Konso traditional houses. The study specifically covers the five Konso fortified villages, namely Dekato, Duraite, Gamole, Gaho and Fasha.

1.5. LIMITATIONS

Additionally, it was difficult to easily get the data sources by the time they were needed as they once went to weed out unwanted plants from their crops and the other time to market. Furthermore, lack of full information from certain targeted individuals and the need to contact different persons for single information was also among the problems challenging the patience of the researcher. Financial and time constraints during the data collection were also other limitations of the study.

1.6. OBJECTIVES

General objective

The general objective of the study is to analyze the characteristics and transformation of the original Konso vernacular houses.

Specific objectives

The specific objectives of this study are:

1. To find out the characteristics of original Konso vernacular houses.
2. To identify the reasons for transformation of Konso vernacular houses.
3. To determine the types of transformation taking place on Konso vernacular houses.
4. To examine the consequences of the transformation.

1.7. RESEARCH QUESTIONS

To meet the objectives of the research the study identifies the factors that caused the transformation and how they are taking place by examining the formation of original Konso vernacular houses. Besides, the outcomes of the transformation are considered. From this perspective, the following research questions are formulated in relation with the specific objectives of the study.

1. What are the characteristics of the original Konso vernacular houses?
2. Why is the transformation taking place on Konso vernacular houses?
3. How are the Konso communities transforming their houses?
4. What are the consequences of the transformation?

1.8. RESEARCH DESIGN DEAGRAM

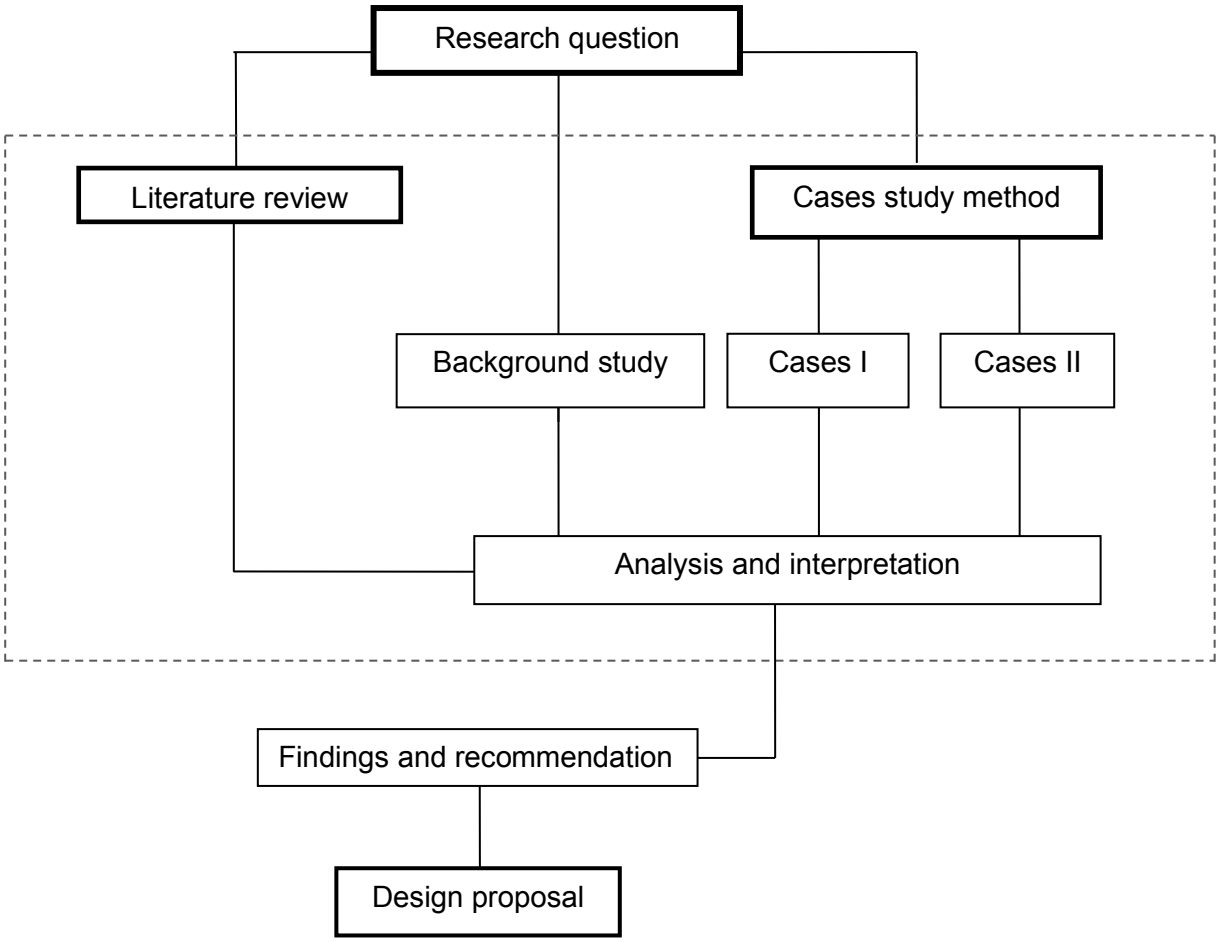

Figure 1.1 shows us research design diagram.

CHAPTER TWO

RESEARCH METHODOLOGY

CHAPTER TWO

RESEARCH METHODOLOGY

2.1. INTRODUCTION

This chapter mainly contains the method chosen for the study, source and type of data, selection and analysis techniques. Moreover, it presents the validity and reliability of the research together with reflection on the methodology used.

2.2. METHOD

According to research methodology researchers (Yin, 2009) design is the logical sequence that connects the empirical data to a studies' initial research questions and ultimately to its conclusion. In this case, a research design is a logical plan for getting from here to there, where here may be defined as the initial set of questions to be and conclusions to be drawn. In the process of the research there may be found steps like collection and analysis of relevant data. Based on this concept, the researcher chose case study methhod as a preferable design to produce ample information and get a thick description of the nature of the vernacular houses. This method is appropriate to answer 'why' and 'how' questions by giving extensive and in-depth description of some social phenomenon. This study took place in a specific place by having a look at the phenomena in detail. It is mainly aimed to come up with the characteristics and the transformation of Konso vernacular houses.

2.3. SELECTION OF CASES

According to Yin (Yin, 2009), the researcher has the right to select cases straight forward or using certain techniques based on the researcher's prior knowledge or complexity level of the cases. Therefore, two clustered case areas are selected which are known by the Woreda Administration. One of the Clusters is closer to the Zonal Town while the second cluster is 23 KMs away from the Zonal Town. Both cases are administered separately. The reason is that the researcher wanted to know if the closeness of the cases to the town has influenced the villages or not. Under the first case, three walled villages /Kebeles/ were selected and the second case is used to cross check the reliability of the data in and across the cases. The walled villages chosen for the study in the first case are closer to each other and the same is true for the villages in the second case. Additionally, the residents of the respected walled villages chosen under both cases have their own language dialect that impacted their

way of living. This helps to come up with the necessary information to compare the nature of the transformation of the Konso vernacular houses in the two environments.

2.4. PURPOSE OF DATA COLLECTION

The study is mainly to address the characteristics and the transformation of the original vernacular houses. The data is collected to explore and define the nature of vernacular houses and changes they are undergoing.

2.5. TYPE AND SOURCES OF DATA

The research used primary and secondary data. The primary data was gathered from interviews, focus group discussions and observation. The secondary data was gathered from researches conducted in Konso area and books written regarding the study area.

2.6. DATA COLLECTION TECHNIQUES

The study mainly used tools like in-depth interview, focused group discussion and direct observation to collect the data. Additionally, it employed sketches, mappings, pictures and documents as data collection techniques.

In-depth Interview

According to Yin (Yin, 2009), interview is one of the most used sources of data for case study information. In-depth interview is instrumental to produce and establish cases. The in-depth interview is used to find out facts and opinions about the determining factors for the formation and transformation of the Konso vernacular houses. It was held with the community elders, clan leaders, individual residential compound owners and housing experts who were thought to have deep understanding of the housing tradition of the community. It helped the researcher to dig out sound information of the Konso housing culture.

Focused group discussion

Focus Group Discussion (FGD) is a method of data collection which is frequently used to collect in-depth qualitative data in various descriptive studies such as case studies, phenomenological and naturalistic studies (Organization, 2013.) . The main goal of Focus Group Discussion is to provide an opportunity for the participants to talk to one another about a specific area of study. The facilitator is there to guide the discussion.

As Yin (Yin, 2009) points out, it is a data collection tool which gives space for the target group to comment on each other's response and give more reliable and valuable information. So, the researcher used it with the respected Konso elders, clan leaders, and assistants to clan leaders and traditional housing experts separately and in a mixed manner. From the discussion, diverse and multi–directional information that helped the study to see things from different angles were raised.

Direct Observation

Yin (Yin, 2009), states that case study creates opportunity for direct observation. Observational evidence is often useful in providing additional information about the topic to be studied. For this reason, the researcher employed observation as a data collection tool. I had spent days with the target population during the data collection period. This gives me an opportunity to gather actual data through my personal observation. Direct observation was an ample data collection tool in that it enabled me to comparatively see the theoretical concepts studied in the class and what was practically taking place. Besides it helped me to grasp the top important data for the study.

2.7. SAMPLE SIZE AND SAMPLING TECHNIQUE

Two factors are in place for the selection of the cases, looking for the place which was assumed to be the first settlement area was the first factor. Accordingly, three walled villages were selected. The second factor was location. The fact that three of the villages are close to the Woreda town and the other two are far from it is useful to check the influence they get from the urban environment.

2.8. TECHNIQUES OF DATA ANALYSIS

The data gathered for the study was first presented and then analyzed using pictures, drawings, maps, sketches and tables. The analysis was done in line with the research questions. That means the research questions were taken as topics and the data in both cases were analyzed separately and together based on their nature. Moreover, the data gathered from different individuals on the same issue was presented and analyzed one after the other. It is triangulated to clearly identify the key point. After that, it was interpreted by giving necessary explanations about each and every of the data analyzed.

2.9. VALIDITY AND RELIABILITY

The research was carried out to mainly answer 'why and how' of the characteristics and transformation of the Konso vernacular houses. So, case study is the appropriate design to do this. The data for the study was gathered from representative and informative samples using qualitative data collection tools. The data collection tools enabled the target individuals to freely disclose all the information they knew to the last drop. The researcher also qualitatively analyzed and interpreted the data. Therefore, the study came up with all the valuable data and changed it to output using reliable method.

2.10.REFLECTION ON THE METHODOLOGY

The study used qualitative method to analyze and interpret the data. It enabled the researcher to comprehensively present all the information gathered from the target population and flexibly discuss every bits and pits of information in a way readers can easily understand them. With no doubt, it is appropriate method that helped the study to come up with the intended result.

CHAPTER THREE

REVIEW OF RELATED LITERATURE

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3.1. INTRODUCTION

This chapter discusses related literature to the basic research questions. It is organized based on the basic questions of the research having topics and sub topics which detailed key points to be raised in there in a way sources were properly cited.

3.2. VERNACULAR ARCHITECTURE: THEORY, MEANNG AND CONCEPT

It's a difficult task to get a single definition of vernacular architecture because there are so many parameters attached to vernacular. Besides, there are contradictions among the theorists and researchers to recognize the vernacular architecture as architecture.

The Encyclopedia of Vernacular Architecture of the World defines vernacular architecture as:

Comprising the dwellings and all other buildings of the people. Related to their environmental contexts and available resources they are customarily owner-or community-built, utilizing traditional technologies. All forms of vernacular architecture are built to meet specific needs, accommodating the values, economies and ways of life of the cultures that produce them. (Olive, Encyclopidia of Vernacular Architecture, 1997).

Frank Lloyd Wright on his part described vernacular architecture as: "Folk building growing in response to actual needs, fitted into environment by people who knew no better than to fit them with native feeling." Suggesting that it is a primitive form of design, lacking intelligent thought, but he also stated that it was still better particularly in Europe.

Amos Rapoport was one of the first persons to develop a new way of studying traditional house forms with specifically developed methods. Traditional house is, in whatever culture, always an accumulation of various and different lines of development (Egenter, 2005). Rapoport creates his factors-analysis on vernacular houses of different elements like the roof, the entrance gate; windows and wall have their own development.

With regard to socio cultural factors, house forms can also be strongly related to patterns of cultural behavior, cultural values and world views. Lewis Henry Morgan researched this concept

using factor analysis method and by identifying various types of social behavior and customs which could be related to their houses among Indian tribes (Egenter, 2005).The development of houses is from the simplest shelter to the complex one. Most of the vernacular houses are qualified as vernacular because of the construction materials, space and form. Materials, construction, and technology are best treated as modifying factors, rather than form determinants, because they decide neither what is to be built nor its form – this is decided on other grounds (Rapoport, 1969).

3.3. CHARACTERISTICE OF VERNACULAR BUILDINGS

The description of scholars on the characteristics of vernacular building can be summed up as: lack of theoretical or aesthetic pretensions; working within the site (e.g. fitting in micro-climate); respect for other people and their houses and hence for the total environment; man-made as well as natural; and working within an idiom with variations within a given order. There are many individual variations within a framework which can be adapted in various ways. Although a vernacular always has limitations in the range of expression possible, at the same time it can fit many different situations, and create a place at each. It is, of course, precisely this limitation of expression which makes any communication impossible. To communicate, one must be prepared to learn as well as use the language- which implies the acceptance of authority, trust, and a shared vocabulary.

Another characteristic of vernacular is its additive quality, its un-specialized, open-ended nature, so different from the closed, final form, typical of most high-style design. It is this quality which enables vernacular buildings to accept changes and additions which would visually and conceptually destroy a high-style design (Bruno Taut,1958).Vernacular is also characterized by the greater importance and significance of relationships between elements, and the manner in which these relationships are achieved, rather than by the nature of the elements themselves. This, however, leads us into the realm of urban design.

Vernacular houses are the results of the collaboration of many people over many generations as well as the collaboration between makers and users of buildings and other artifacts. Since knowledge of the traditional model is shared by all, there is no need for drawings or designers. A house is meant to be like all the well built houses in a given area. The construction is simple, clear, and easy to grasp. Since everyone knows the rules, the craftsman is called in only because he has a more detailed knowledge of these rules. Size, layout, relation to bite, and other variables can be decided by discussion and, if necessary, set down in a written contract. The aesthetic quality is not specially created for each house – it is traditional and handed down

through the generations. As we shall see below in our discussion of Konso vernacular houses, tradition has the force of a law honored by everyone through collective assent. It is thus accepted and obeyed, since respect for tradition gives collective control, which acts as a discipline.

This traditional approach works because there is a shared image of life, an accepted model of buildings, a small number of building types, and, finally, an accepted hierarchy and hence an accepted settlement pattern. As long as the tradition is alive, this shared and accepted image operates. When tradition wanes, the picture changes. Without tradition, there can no longer be reliance on the accepted norms, and there is a beginning of institutionalization.

3.4. FACTORS INFLUENCING VERNACULAR ARCHITECTURE

Climate and the Need for Shelter

For Archer (Archer, 1963) climatic determinism has been widely accepted in architecture as well as in cultural geography, although in the latter it has been recently found rather less favorable. One need not deny the importance of climate to question its determining role in the creation of built form. In architecture the climatic determinist view, still rather commonly held, states that primitive man is concerned primarily with shelter, and consequently it is imperative that climate determines form. Among the Konso, maternity houses are constructed with exceptionall thicker walls and roofs in order to maintain teprature.

We therefore build houses to keep in a consistent climate, and to keep out predators. We grow, gather and eat food to keep our metabolism (Archer, 1963). While this is questionable in regard to either housing or food today, it is not true even for primitive man, who has many dwelling variants and food taboos and restrictions within his economies of scarcity.

Materials, Construction, and Technology

The first factor influencing the development of vernacular construction practices is related to the availability of local building materials. in many areas, the locally available resources have governed the use of the following constituent materials for walls: adobe (mud blocks or whole walls), masonry (stone, clay, or concrete blocks) and timber. Frequently, a combination of materials has been used in the construction. For example, the use of timber elements within walls found in Pombalino buildings in Portugal (WHE report 92 cited by the writer) and in traditional construction the crucial point is ensuring its resistance to earthquake and other natural disasters.

Earthen dwellings utilize mud walls or adobe block walls. This type of construction is widespread in many different cultures, especially among poor populations that do not have access to more sophisticated building materials. Adobe construction offers a very limited seismic resistance; however, there are a few strategies for improved earthquake resistance of these buildings. One of the strategies is good choice of building shape (preferably a circular floor plan). In order to achieve desirable seismic performance, it is crucial that the floor plan be absolutely regular. If possible, it should be symmetrical in both orthogonal directions. Using walls with timber reinforcements is another strategy in place. Timber reinforcement can be added to increase ductility and secure the connections given it is adequately protected against humidity and insects (such as termites in Africa and India). This ensures long-term structural integrity and use of a lightweight roof to reduce the mass on top of the walls; a secure roof-to wall connection is essential for satisfactory earthquake performance

The Bhonga house in Gujarat, India (WHE Report 72) and the Yomata house in Malawi (WHE Report 43) are typical examples of traditional earthen dwellings. Two versions of Bhonga roofs have been identified: the traditional thatched roof, and a more modern clay tile roof. Clay tile roofing has probably been adopted because it provides superior thermal comfort when compared to the thatched roof. However, it adversely affects the seismic response of these buildings because of larger overhead masses. Also, the tiles pose a hazard as they often fall if they are not properly attached to the roof structure. The importance of the roof type in traditional adobe buildings has been confirmed in earthquakes. A lightweight roof, such as the thatched roof, typical for traditional housing construction.

The most widespread vernacular housing construction involves the use of masonry walls as the load-bearing structure. The simplest technique is based on the use of sun-baked blocks, generally classified as adobe, described in the previous section. The use of burnt clay bricks is widespread where wood or coal fuel is available. Clay brick is a traditional building material used for centuries in many parts of the world. Stone is the locally available material in some regions. Unshaped stone blocks collected in the field have also been used for housing construction for centuries, mainly in the form of uncaused (random) stone-rubble construction. In some cases, the stones have been shaped, usually by hand tools. Such construction is called “dressed-stone masonry.” Examples of this construction are found in Nepal (WHE Report 74, WHE Report 47), India (WHE Report 18, WHE Report 80), and Slovenia (WHE Report 58).

Examples of traditional wooden houses are found throughout Japan (WHE Report 88) and the Russian Federation (WHE Report 56). The advantages of timber housing construction stem from the use of timber, a lightweight and ductile building material. A critical issue in timber construction is related to the connections (floor-beam, column– beam or panel-beam) and their ability to transfer the forces from one building member to another and then down to the foundation. It should be noted that the wood is quite vulnerable to the effects of humidity and insects. Moreover, the use of timber construction is limited by the local availability of suitable wood materials. Yurta, a traditional dwelling in Kyrgyzstan, is an example of earthquake-resistant timber construction as indicated in the report. The load-bearing structure consists of wooden poles forming a frame enclosed by felt tension cloth. These dwellings consist of a circular plan and are extremely lightweight (Kyrgyzstan, WHE Report 35).

The Pombalino buildings (Portugal, WHE Report 92) have been used in Portugal since the great 1755 Lisbon earthquake. They represent an early form of braced frame timber construction, where the wooden frame is filled with brick masonry or adobe blocks. Similar forms of earthquake-resilient vernacular construction, timber braced frame construction with masonry in fills, are found in Turkey (himis), Kashmir, India (dhajji-dewari)2, and also in Northern Europe and Italy (where they have even been included in seismic regulations).

Bahareque, a traditional construction found in El Salvador, consists of timber studs, with wood or bamboo lath forming a mud-filled pocket in the wall (somewhat similar to the North American form of timber construction). This type of construction has also been exposed to numerous earthquakes in the region and has generally performed very well.

As it shall be detailed in chapter 5, costruction materials in Konso mainly involves wood, stone, grass and barks.

Site

It is difficult to be certain that any consistent theory of site has ever been proposed. However, there have been attempts to explain the form of such settlements as Italian hill towns and villages in the Greek islands-hence also house form-in terms of terrain, lack of land, and so on. There is the ecological determinism of Evans-Pritchard and others regarding the Nuer in the Sudan and the work of Brockmann in Switzerland attaching a great deal of importance to this aspect (Evans-Pritchard, 1960).

It would be wrong to minimize the importance of site for primitive and vernacular builders, but one can question the determining influence of the site on house form. The importance of site is shown by the almost mystical attachment of primitive, and even peasant, cultures to the land, testified to by the care with which land is treated and houses placed on it. This attachment can lead to persistence of sites because of their traditional nature.

The impact of site on crops is more critical than on house form, yet even crops in one particular area may change as they have done in Ceylon from spices to coffee, to tea, to rubber, and may change again. Of course, there are physical limits – one cannot grow pineapples in Greenland – but there are many choices for any area (Febvre, 1922). Similar site conditions can also result in very different house forms, and similar forms can be built on very different sites. Water, as a site, for example, can be handled by building over the water as pilots, building on the shore, or using a floating house. Site makes some things impossible – one cannot have a floating house where there is no water – but all the forms have been used and all have variants.

Very similar sites often show very different forms; for example, on the coast one can aim for the view or turn away from it. Even sites as forceful as mountains, deserts, and jungles have produced great variations in house forms. As it is noted, site influences both the city and the house, but it does not determine form. We might say with Vidal de la Blache cited in (Amos., 1969.) that “nature prepares the site and man organizes it to enable him to satisfy his desires and his needs.” In one sense, the effect of site is cultural rather than physical, since the ideal site depends on the goals, ideals, and values of a people or period, and choice of the “good” site-whether lake, river, mountain, or coast-depends on this cultural definition. Use or non-use of mountains may be due not to their difficulty as sites but to the attitude taken toward them. (Deffontaines, 1962).

Site selection may be due to supernatural aspects or may depend partly on the political and social viewpoint, as in Islam, where in some periods coastal sites were sought for cities, while in others inland locations were preferred. (Issawi, October 27-29, 1966). Within cities, preferred sites have varied in similar ways. Typical of Moslem cities is the location of “nobler” crafts immediately around the Mosque and “baser” ones further out, a pattern independent of the nature of the physical site. It was brought to Mexico by the Spaniards (who probably got it from the Arabs), and in the same area we find both Indian towns with a random distribution of trades and Spanish towns with the “Islamic” pattern of “noble” trades and rich houses clustered around the Plaza.

Building vernacular houses of Konso are located on hills and mountainous sites. Residential compound of clan leaders of Konso is located the walled villages.

Building Layout and Size

Another determining factor is the building layout, that is, the typical shape of a building plan, usually related to many cultural, historical, and urban planning traditions. Three main plan shapes have been identified in traditional buildings, namely circular, rectangular and linear plan (row houses or wagon-houses in Romania). The circular floor plan offers the best resistance to earthquake forces. The third and final aspect relates to the size of a building. Based on their size, these buildings can be classified as: single story and multistory buildings. The size of the building is governed by its particular use. For example, a dwelling can be used for sleeping only, for sleeping and eating, or for mixed use (sleeping, eating, and working). Clearly, the mixed-use buildings necessitate construction of an additional floor, which calls for increased wall load-bearing capacity, especially if these walls also need to withstand earthquake effects. It should be noted that the building size is also related to the population pattern and housing density in a given area. For example, single-story buildings are common for rural areas, whereas multistory buildings are most often found in densely populated urban areas.

The Konso building tradition also involves peculiar layouts within the residential compound. To cite an example at this stage, the sleeping housing characters are built on the upper part of the space of the residential compound.

Defense

Typically, when social explanations of house form are proposed, defense and economics are most commonly considered. Defense has been cited more to account for tight urban patterns than to explain the form of dwellings, but even in this respect it does not provide a fully adequate explanation. Prehistoric Crete provides a good instance of an area where defense could not have been the reason for the tightly clustered settlements, which must be attributed to the gregarious instincts of the people. This gregariousness, which applies to the Mediterranean as a whole, still prevails today. There are few isolated farms in Crete, although there may be some isolated huts occupied during certain periods of the year. The Cretan's house is in the village, if possible. The unsociable Englishman prefers to live near his work even if he has to walk miles to visit his neighbors, his pub or his chapel. The social Greek prefers to live in a crowded village among his friends and his cafe, even though he may have to walk miles to till his fields or trim his vines, and I think the prehistoric Cretan was like him. (Hutchinson, 1962).

The compact towns have been attributed to the needs of defense, lack of money (so that the houses themselves had to form the city wall), lack of arable land and the need to conserve it, and the need for shading for climatic reasons. Since all of these undoubtedly play a part, no single causation is possible; we need also to consider the element of choice, as exemplified by a love for crowding.

Defense certainly plays a role in deciding house form, and use of stockades, palisades, and fences has defensive implications as well as the religious ones. Defense, however, never fully accounts for form and may even be symbolic, as has been suggested for the Pueblos. (Jackson, 1953-54). Even where defense is obviously of great importance, as among the Masai, the specific form of the dwelling is related to their attitude to cattle, which is a very different matter. The Masai warriors' kraal, which is also defensive, has a form very different from the "normal" kraal and no fence, while the Mousgoum farm in Tchad is also an enclosed circle for defense, a type of nomadic encampment in permanent form, but different from the Masai version as the writer put it.

Defense considerations are there among Konso traditional construction culture also. Pafta, a communal house of the Konso is mainly used as defense post.

Economics

Economics has been widely used to explain settlement and building form, and its importance is indeed great. In an economy of scarcity the need to survive and to use resources maximally is so great that these forces may be expected to wield tremendous power. If, even under those conditions, economic forces are not dominant, then the argument for economics as gear & ally determining form becomes rather suspect. Even in economies of scarcity there are many examples of herders living among agricultural people and not only failing to accept the economy available, but despising it and the people who practice it. The Babenga and the Pygmies exchange agricultural products and game without giving up their way of life (Rasmussen, 1960). The Masai, Bakitara, and Banyankoli in East Africa avoid the economic possibilities of the examples around them, and use their cattle unwisely in economic terms because of the social and religious importance of cattle (Mikesell, 1962).

Since houses are less critical for survival than food, we would expect them to be even less affected by sheer economic necessity. In Annam, as soon as a peasant has money he builds a house, beautiful but not comfortable, and beyond his means; there are more rich houses there than rich families (ibid). Generally, since people with similar economies may have different

moral systems and worldviews, and since the house is an expression of the worldview, economic life has no determining effect on house form. Even lack of labor specialization, so typical of primitive communities, and to lesser extent vernacular builders, may be socially and culturally rather than economically motivated and specialized labor may be despised. Even collaborative building may be due not to economic needs or complexity of task, but be socially motivated. An example is the Cebuan dwelling in the Philippines: which would be more economical if built differently, but social cooperation, good will, and community are the dominant factors (Hart D. , 1959) ; (Redfleld, 1953).

Economic factors are also taken into account when the Konso build houses – which is a quite expensive engagement. However, as it will be considered in chapter 5, the Konso give much weight to cultural values.

Religion

Possibly as a reaction to the physical determinism so common in writings on the subject, there is also an anti physical determinism, which neglects a whole set of important material factors and attributes the form of houses to religion. This view has been expressed best by Deffontaines and Mircea (Eliade, 1961).The latter takes the more extreme position which he sums up as “the sacredness of the house” and succeeds in demonstrating that the house is much more than shelter. It becomes clear that this alternate view explains many aspects of the house at least as well as the physically oriented view of the house as shelter. However, the religious view is oversimplifies in trying to attribute everything to a single cause. It is one thing to say that the dwelling has symbolic and cosmological aspects, that it is more than a device for “maintaining the equilibrium of the metabolism,” and another to say that it has been erected for ritual purposes and is neither shelter nor dwelling but a temple.

Once again the general point, even if accepted, fails to account for form, and the specifics need to be considered. If we accept that the house belongs to the woman and is primarily related to her, and that man therefore visits the woman and her bed, the actual forms and devices used are very different indeed. Religion alone cannot account for this, so there must be other forces involved – a view strengthened by the fact that even today there are differences in the men’s and women’s domains in the American and English house (kali E. T., 1966). Similarly, the sacredness of the threshold and portal, and hence the separation of the sacred and profane realms, can be achieved through the use of numerous and varied forms.

Deffontaines does refer briefly to the action of material forces, and is therefore more balanced than Raglan. However, because he concentrates on the religious aspect alone, and brings an overwhelming amount of material to support his view that religion is the determinant of form in landscapes, settlement patterns, cities, houses, demography, cultivation, and circulation, he presents a rather distorted view.

Religion affects the form, plan, spatial arrangements, and orientation of the house, and may be the influence which leads to the existence of round and rectangular houses. The reason for a culture never having had round houses may well be due to the needs of cosmic orientation round house cannot easily be oriented. In Africa the distribution of round and rectangular houses is related to the distribution of religion, and many examples can be found, like the Zulu, where orientation is unimportant, round houses are used, and there may not be any straight lines. An extreme contrast is the Trano of Madagascar, which is oriented through strict axes and astronomical rules as (Amos., 1969.) Indicated.

Among the Konso too traditional or indigenous religious ceremonies affect the built environment considerably.

3.5. TRANSFORMATION: THEORY AND MEANING

The use of local building materials are a fundamental defining quality of vernacular architecture, its traditions are regarded as having ceased with the mid-19th century development of the railroads and commercial shipping which facilitated international and even intercontinental movement. Transformed and metamorphosed materials such as concrete block, and soil cement, introduced by the modern building industry or in development projects, have considered the life of contemporary traditional building. Use and provide the basis for the emergency of new vernacular form. (Olive, Encyclopidia of Vernacular Architecture, 1997)

Vernacular architecture is described by Gombrich 2005, as the greatest creation of mankind. Traditional architecture is fading away along with the lifestyle it once supported. The relationship between house form and culture is inseparable. As (Amos., 1969.) notes "house form is not simply the result of physical forces or any single causal factor, but it is the consequence of a whole range of socio- cultural factors seen in their broadest terms." Vernacular architecture is valuable, not only as a repository of historical and cultural information, but also as a model that shows how the built setting has been adapted to respond to the needs of its occupants through changes in both the social, economic and the physical environment. Through the study of vernacular architecture, we can gain insight into how architecture interacts with cultural and

environmental change. (Rubbo, 1979) Widening "design gaps" and the "cultural invasion" The "design gap" problem and the effects of "cultural invasion" are considered the twin predicaments that make the study of vernacular architecture worthwhile. These two problems are intertwined and must be simultaneously discussed.

These widening gaps contribute to the incongruence between architectural design and fulfillment of the needs of stakeholders. Bell and colleagues (2006) identify gaps between four groups of stakeholders involved in the design process, namely the designer, the researcher, the developer, and the using clients have widened significantly as many societies shifted from an essentially agricultural economic system to more industry oriented systems. Design gaps are originated from two sources as to. As the parties involved in the construction process changed with the advent of new construction techniques, and as changes in the formal design education system evolved, design gaps increased in scope and magnitude. Prior to the 1930s, neither an architect nor a developer played any part in the construction of the houses of regular people. Instead, houses were built in the traditional vernacular style through a close collaboration between the craftsman and its future occupants. These local craftsmen were actually farmers that doubled as builders when required. They learned the meticulous technique and sophisticated wisdom associated with the construction of indigenous architecture, which had been passed down through generations via the slow process of a master-apprentice learning system (Pongmethakul, 2002). In earlier periods the training of craftsman presumably occurred through a master and apprentice system. Professional architects, in the western sense, started to become more influential in Thai society between the reign of King Rama V (Chulalongkorn), in 1868, and the end of the reign of the King Rama VII (Prajadhipok) in the early 1930s. Among the aristocrats who considered themselves trendsetters, European designs were considered highly fashionable. These architects, foreigners who were exclusively from European countries, were hired by aristocratic and royal families to design their palaces and mansions. In the late 1930's, with the founding of Thailand's first school of architecture on a western model, the influence of European design became firmly rooted. As a consequence, such knowledge and its application are treated as nearly irrelevant by the then architects.

Another factor contributing to the widening gap between designers and clients is the culture of design schools themselves (Susanroat, 2000). The formal education in design schools not only trains the novice to become an experienced designer, but also works as a mechanism in which architectural tradition and group identity are acculturated. Groat notes that, as graduation from design school nears, not only the students' perception of architectural types are transformed by a finer sense of design acquired through intensive training, but also, their personal goals often

shift from a desire provide a useful design service to an ambition to create magnificent building designs. The need to create the built environment to support the needs of lower class clients is often considered as subservient.

As to (Denyer, 1978) there is about architectural style are almost as much a part of a culture as the styles themselves. The description of building styles in Africa has suffers from interpretation, often apparently founds more emotional than in careful style, put forward by generation of outsiders, mostly of African houses were built-in circular forms and curved with round roof shape and having conical or flat in shape but as to Denyer under influence of foreign contacted there are gradually give way to transform their building forms to rectangular one. He was add the process of transformation redevelopment from primitive to a more advanced state, has resaved such powerful advocacy over a period of almost 250 years.

Denyer shows in his book the process of change could be either gradual or sudden and that despite political and economical changes house style have in some cases remained basically constant. He described in Tigrie in Ethiopia a a pottery model of a house dated to the fifth century was excavated in 1959 and shows remarkable similarities with present-day Tigrie house yet in other parts of Ethiopia in the thirteen century there was a decisive break with tradition up on the accession of the Solomonial dynasty when the stone-built capital was replaced by a tented camp arranged in concentric circle, which moved round the country.

Change is also one of the major topics of this paper.

3.6. TOTAL TRANSFORMATION OF VERNACULAR ARCHITECTURE

According to (Catherine R. Ettinger, 2008) among the specific traditional practices that are problematic in the space of totally transformed houses may include the following:

The use of outdoor space

The traditional house has a few large rooms articulated by covered walkways. These spaces can easily be adapted to different uses and often change seasonally whereas the “modern” house has a segmented spatial scheme in which the reduced dimensions mean there is little flexibility in use. One of the greatest changes with the substitution of the traditional house is the establishment of a clear distinction between indoor and outdoor space. The traditional threshold is replaced by a front door. The transitional spaces between indoor and outdoor space and the public and private realm disappear and the transition is abrupt.

Food preparation

Food preparation in the traditional house is done in the kitchen structure – an isolated element with a clay or adobe In the traditional house, the space of the kitchen is a personal space, belonging to the woman of the house. In some areas it is so closely associated with the woman it belongs to, upon her death the family will build a new kitchen rather than use the existing one. For this reason it is not surprising that the new modern kitchen with appliances such as a gas stove have not been easily accepted in many communities. They are part of the house, and shown off to visitors as symbols of modernity, but often remain empty and unused while a traditional structure in the back yard remains in use.

Storage

The installation of an urban house in a rural area presents contradictions. The attics and corridors of the traditional house provide space for the storage of corns and agricultural tools. The loss of these spaces in the new house implies improvisation. Since grains are traditional stored above the house, it is common to find second story bedrooms used to hold the dry corn for a year's supply of tortillas. In the new houses, the idea of closet is foreign, so nails are placed in the walls to hang clothes in the customary fashion.

Notions of privacy and the public realm

The traditional spatial distribution reflects social practices and ideas and norms of interaction among different members of the community, just as the new one imposes new uses. Women are not present when men gather to talk and the kitchen is an area of the home men only enter at meal times. In a house where the living and dining areas are open and connected to the stairway, wives and daughters are practically imprisoned on the second floor when men are present in the living area. The spatial structure of the traditional abode allowed different members of the extended family to move about the compound and visitors generally do not penetrate the indoor space of the home.

Another modification with the new spatial scheme is the appearance of separate sleeping quarters for children. One man referred to his experience as a migrant worker in giving him new ideas about privacy: "in the villages it is common for everyone to sleep together in one room or in the corridors, but one who has had the opportunity to be on the other side or to get an education, assigns one room to their son and another to their daughter".

House as Representation

The implementation of a new house form in the context described implies sacrifice on the part of the owners; it implies a willingness to change and to adapt in order to inhabit modernity. The explanation for this sacrifice lies in the realm of the house as a representation of self, of the relation of self to community and of personal success. Here, following a more recent formulation by Amos Rapoport "Meaning is not only part of function, sometimes it is the most important function of a house." Within the vernacular settlement, the new house stands out. The continuity of adobe or stone walls is broken by the two storey brick and concrete structure and within the natural color scheme dissonant oranges, blues and greens appear. The house is used as a medium for expressing individuality, success or simply difference; it is one of the most visible signs of profound change in the sense of community.

3.7. HYBRID TRANSFORMATION OF VERNACULAR HOUSES

As to (Ranjith Dayaratne), Department of Architecture, University of Bahrain, swinging between tradition and modernity, some built forms can only be described as being 'hybrid' which posses characteristics often of both the vernacular and modern or sometimes even belonging to neither.

Interesting dichotomies are being created and it is undeniable that the vernacular settlements and architecture demonstrate a great deal of resilience, adaptability and innovation although often unrecognized, misunderstood and misrepresented it is to beaccepted professionals architects and planners cannot participate in the peoples' processes of place making; building, inhabiting and creating cultures and built-forms and places, unless they understand the true nature of the settlements in which they have to act. Whether it is large scale developments or one-off mega projects, the inter-connectivity of the vernacular and the modern and the reciprocal relationships that impact upon each other cannot be left unattended.

The emerging hybrid ties need to be mapped, theorized and articulated in order to bring to focus the metamorphosis presently taking place in the contemporary settlements and its architecture.

3.8. FACTORS FOR TRANSFORMATION OF VERNACULAR ARCHIETCHURE

Urbanization and Globalization

According to (Ranjith Dayaratne,) during the20th century, accelerated development, urbanization and globalization have impacted heavily upon the vernacular and traditional built environments. Undeniably, slow pace of change that was natural to these environments have

been replaced by fast and abrupt changes in all spheres of society. Numerous as they are, rural urban migrations, programs, mega projects, information revolution, improved transportations, modern construction technologies and changing values and attitudes have been seen as major forces of such change. Indisputably, the intimate relationships between built-environments and the cultural values of those who build and inhabit them have been fractured as can be seen through the transformations:

Spatialmanifestations, material adaptations, mutations, extensions, symbolic gestures and often conspicuous built forms. Nevertheless, despite the massive increase in urban populations and modern settlements, a very significant proportion of vernacular and traditional characteristics still exist, transformed in numerous ways and adapting to the change.

Materials, construction, and technology

Materials, construction, and technology are best treated as modifying factors, rather than form determinants, because they decide neither the house is to be built nor its form-this is decided on other grounds. They make possible the enclosure of a space organization decided upon for other reasons, and possibly modify that organization. They facilitate and make possible or impossible certain decisions, but never decide or determine form. (Ayp, 1954). To create any type of place, space must be enclosed. The availability and choice of materials and construction techniques in an architectural situation will greatly influence and modify the form of the building. The reason why construction (which, of course, involves technology) and materials are best regarded is modifying factors, in spite of their fundamental nature, is that they do not determine form. They merely make possible forms which have been selected on other grounds, they make certain forms impossible, and, in acting as a tool, they modify forms.

One of the basic problems of architecture, and the principal problem of construction, is the spanning of space-the collection of gravitational forces and their transmission to the ground, usually requiring materials having reasonable tensile strength and a reasonable weight-strength ratio. In primitive time, these are limited to organic materials either animal in origin (bone, skin, and felts) or vegetable (timber or plaited, woven, or twisted vegetable fibers in such forms as matting, textiles, and rope). The only addition in the preindustrial vernacular is an occasional small quantity of metal. Where no such materials are available, or are difficult to obtain, special forms of construction-e.g., beehive vaults and domes, true vaults and domes-have been developed. In some cases, the need for materials with tensile strength has meant bringing timber great distances. Because of its scarcity the beams have been used full-length, so that portions project; these beams are removed and reused many times.

Climate

As to (Amos., 1969.), preindustrial builders cannot share this attitude, since they lack the technology to allow them to ignore climate in design. Therefore, a lesser extent peasant builders are faced with the task of creating shelter for a wide range of climatic conditions. For their own comfort (and occasionally even survival), they have to create, with very limited materials and technology, buildings which respond successfully to the climate. It could be argued that, if we consider hostility of environment and available resources, the problems faced by the Eskimo are not unlike those involved in the design of a space capsule. The difference is less than one would imagine. The house responds to the physical stresses of climate heat, cold, humidity, radiation, and light-it must also respond structurally to the mechanical stresses-gravity, wind, rain, and snow.

Other Factors

One of the main features of vernacular architecture is that it does not fully comply with the established characteristics. It is an 'additive' and 'evolutionary' architecture regulated by many factors, like the economic situation of the inhabitants, the growth of the family, the unplanned need of a new function...etc.

Today, the rehabilitation process does not only result from the need for additional space nor to maintain and renew, but it is the outcome of a certain reverence to the past (Levant, 2004). In a very short period, as to the writer, the flat earth roofs of the villages of Mount Lebanon are replaced by imported red tiles on pitched roofs. From almost empty and minimal single space to a house full of European style furniture and modern utensils, the house in the rural space parallels the village's transformation. The village which was an almost independent and self sufficient agglomeration where the life revolved - and was centered - about: land, kinship, and religion was in a few decades transformed into a suburb. (Gulick, 1955) It now revolved around the Western world, especially after the centralization of the state and the independence of 1943. In 1920, new materials of construction are introduced (especially concrete as of the 1930s) and new influences (colonialism and modernism) are beginning to be visible. Naturally, the extensions on the vernacular are built using this new vocabulary. With the spread of the use of concrete, came the decrease in the number of craftsmen that transmitted their know-how for generations. Many flat compacted earth roofs were replaced with reinforced concrete to reduce maintenance; stone lintels are replaced by concrete lintels which are more efficient in tension. And many houses received larger concrete terraces and balconies; concrete was not used solely for its physical characteristics but slowly began replacing old construction techniques.

Luck of Strong Policy Framework regarding Vernacular Architecture

As of the end of the 1950s, partially as a policy of the state to reduce rural exodus, infrastructure was introduced to rural areas which caused an uncontrolled urbanization of the ruralspace (Srakis, 1958, 2003, November 1933.) With the expansion of the rural space and the construction changes, the tradition of vernacular architecture has ceased to live, becoming a mere trace of the past in different forms: from ruins to still used houses but changed and mutated to adapt to the present. In the 19th century, no official building code was applicable in the rural space and the heritage laws established by the Ottoman Empire, were restricted to antique archeological sites, without considering what is today regarded as traditional vernacular architecture. Even during the French mandate period, heritage was limited to the archeological remains and monuments for political reasons. In Lebanon, for example, traditional architecture was always used in ideological construction (Davie 2003). Since 2000, Lebanon has had a pending law project that was prepared by the ministry of culture. This law aims to preserve Ensembles of Traditional Architecture, reflecting official interest in the issue. However the actual law governing the protection of historic monuments and "antiquities" defines "antiquity" as "…all products of human activity regardless of the civilization they belong to, dating before 1700". Leaving a large majority of the built vernacular heritage subject to the normal building code; reduced to an area that is usually increased with new additions to reach the allowed exploitation surface (decree, November 1933.) Consequently hundreds of vernacular houses are buried under concrete additions, and others are abandoned because of migration.

3.9. CONSEQUENCES OF TRANSFORMATION

According to Siegfried Giedion,1962 & 1964 attaching so much importance to the culturally linked aspects of built form tends to lead to a position of complete relativism. As soon as a given culture or way of life has changed, its form would become meaningless. Yet we know that many artifacts retain validity when the culture which created them has long since disappeared, and that housing and settlement forms are still usable, even though the meaning attached to the forms may have changed very greatly. In fact, in human, as opposed to technological, terms, such forms may often be superior. For example, the Mexican house and the settlement pattern of which it forms part is superior to the American house in many ways, and the European medieval town is more livable, and satisfies many perceptual needs better, than contemporary towns. (Ibid) This suggests that certain aspects of behavior and the way of life are constant, or change very slowly, and that replacement of old forms is often due to the prestige value of novelty rather than lack of utility or even unsatisfactory relation to the way of life. Similarly, of

course, acceptance of old forms may also be due to the prestige value of old things rather than any real continued validity or utility of the forms.

In either case, although both attitudes to old forms are culturally linked, an element of constancy which needs to be further explored seems to be involved, or at least possible. It may be suggested that the nature of man and his institutions contains elements of both constancy and change which affect the subject of built form and can be considered in relation to the biological nature of man, his perception, and his behavior.

The distinction between constant and changeable aspects may have profound consequences on the house and the city. The distinction among the different types of urban space made by some French urban sociologists -physical space, economic space, social space, and many others-can be partly understood in these terms, while architects have suggested that one can usefully distinguish between technological space, such as bathrooms and service spaces, which is changing as equipment and services change, and symbolic, largely living, space, which is constant and usable almost indefinitely. This latter type of space is related to territoriality and clarifies the concepts of “ethnic domain,” separation of spaces inside the house or tent, and separation of domains. The concept of the ethnic domain and the definition of place is fundamental. The specific definition of place is variable-one man’s place may be another man’s non place, and the definition of the good life, and consequently the setting for it, also vary greatly.

Since things are done may be more important than what is done, the element of change is dominant in varying degrees, but not the exclusion of constancy, as is commonly assumed.

CHAPTER FOUR

BACKGROUND TO STUDY

CHAPTER FOUR

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4.1. INTRODUCTION

The chapter came up with general information of vernacular housing characteristics beginning at Africa level and then to Ethiopia. It also presented the contextual and historical background of the study area. In the information presented, the geographical location of the area, socio economic and physical condition, approach, institutional frame work, process actors and challenges faced during the study.

4.2. GENERAL BACKGROUND

African villages usually expressed physically by the social structure of the group of people living in them. Of course, the actual relationships varied from year to year as people were born, married, divorced or died, but the general structure remained fairly constant. (Silfverberg, December 1983) The ideal layout of some villages was often said to be entirely symbolic. The germinating cells vibrating along a spiral path. Many of the village configurations were quite formal or symmetrical, for example the circular plan with horse arranged round the circumference and an open grating space for cattle in the middle, found in South Africa.

In societies where there was age differentiation, this was often reflected in settlement patterns. The Nyakusa who lived in the highlands, north of Lake Malawi, had an interesting system of age group. All boys of a certain age, usually about twelve years, would go off to form a new age-village. They were joined in subsequent years by four or five successive cohorts of young boys. These villages were the permanent place of residence of the peer groups concerned and when they married, their wives joined them. (Silfverberg, December 1983).

According to Encyclopedia of Vernacular Architecture, the Konso, a significant Negroid strain numbering about 87 824 people live in the far southwest and speak an eastern Cushitic language as do many tribes in this region (HALLPIKE, 1972). Their villages could traditionally be found along the floor of the Rift Valley and in the Konso highlands, although they now extend in scattered settlements beyond these limits.

There are many groves of trees in Konso, the main species being Acacia melituria (weybeta), Juniperus procera (birbirta), and Moringa steno petola (Haleko). Some of the large forest woods belong to priests. These trees flourish throughout most of the Konso's land and are of great significance in rituals and house building, large quantities of wood being used for the latter. The Konso are familiar with the properties of many types of wood in terms of durability, strength, and resistance to termites and other qualities. The Konso are sedentary agriculturalists who are almost unique in Africa in maintaining the soil of their fields on steep hill slopes which have been contoured with terraces. The subsistence economy of the Konso, based almost exclusively on land cultivation and pattern of land use, varies from area to area, as does the importance of supplementary cattle herding and trade.

4.3. CONTEXTUAL BACKGROUND OF THE STUDY AREA

Location of Konso and its geographical illustration

Konso is found in the southwest of Ethiopia at about 600 Kms away from Addis Ababa. Formerly, the administration of Konso was under Gamogofa Administrative zone. But, now, it is structured at special woreda level being accountable directly to the Southern Nations, Nationalities and Peoples Regional State (SNNPRS). It covers an area of about 2354.3 km^2. It is surrounded by Derashe, Amaro and Burji Special Woredas and the Oromia Regional State and Debub Omo Zones, in the north, northeast, east, south and west respectively.

The Konso has varied climate: high temperature, dry, hot and rainfall and different landscapes like hilly, valley and flat land. Most of the areas of Konso are characterized by dry and hot Climate with temperature that ranges from 27-50 degree Celsius. The hilly landscape treated with extensive dry stone masonry terraces that serve the society for more than 400 years attested. According to the environmental condition classification, Konso is in a hot climatic zone with altitude below 1,500 meters (4,900 ft) above sea level.

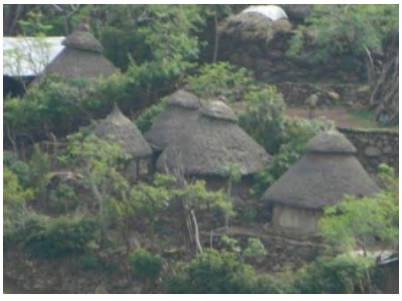
The geographical illustration of the Konso landscape has the following characters:

Picture 4.1 Attractive far view of the terracing farmland of konso.

Picture 4.2 One of the atractive landscape arround Gessergio Kebele in Konso.

Picture 4.3 The good-looking terracing farmland of Kalla Gezaghn in Gamole.

Picture 4.4 The dray stone terracing accumulate the rain water in the rainy season and protect the soil erosion from the farm land.



Picture 4.5 The far view of one of the residential compound in Gamole.

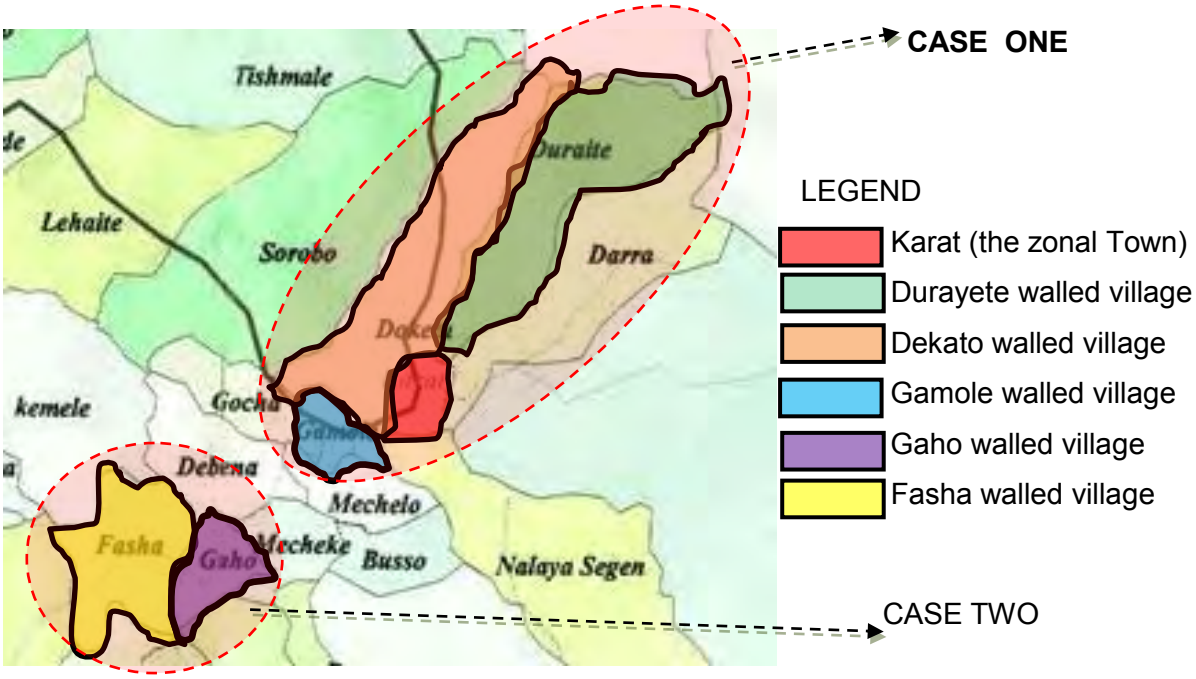
Ethiopia located in east Africa

SNNPRS is one of the nine regional state located in the south west of Ethiopia

Enlarging map of SNNPRS and Konso

Enlarging map of konso and the case study areas

Map 4.1 Locations and Geographical Presentation of Konso. Shows us location of Ethiopia, the South Nation Nationalities People Regional States (SNNPRS) and enlarging map of the case study areas.



Map 4.2 Give explanation us Map of Konso and hay light the case study areas. Show us the two case study locations categorize by two clusters and each having their own study walled villages.

4.4. HISTORICAL BACKGROUND OF KONSO

Origin of Konso people

The Konso people settled at their village about four centuries ago. Based on oral tradition, the Konso people came from two directions, from the east and west. While the eastern group migrated from Leben (Borena) the western group came from the high lands of Derashe, Mashile, Gewada, and Tsemay areas. Most of the Konso people believe that the first settlers came from the eastern part. (Beyene, 2012).

According to Hall Pike, there were three waves of migrations of the Konso people and its ritual chiefs (clan leaders) were *Poqollas*. The first and the second migrants came from Aylota. (HALLPIKE, 1972) Some migrants, the family of Gamole and the ritual head of Dekato, came from Borena. The third wave of migration was the creation of the Konso by the Borena at the end of the sixteen century.

The Konso Settlement Formation

At the beginning of the 16th century, the dispersed Konso people construct their own fortified villages and formed settlements. The Konso formation which is still functional even these days is that they are agriculture based society and have several cultures. The main crops cultivated are Mills, Maize, Wheat and Barley. Their very effective dry stone terracing walls help them in cultivating and preventing fertile soil from erosion, including control over flow of water. The lands of the Konso people have slopes of rocky hills between 1200 and 2000 meters of altitude. The Konso traditionally lived in stone walled settlements on hill sides. Within the Konso settlement there are architectural spaces like individual compounds formed with fences, individual houses with several functional spaces and forms, communal walkways and public spaces like *Moras*. The konso people are exposed to social change (HALLPIKE, 1972). Previously the most active outside influences were from missionaries, the governmental offices, schools and clinics.

The Konso settlements are two types; the compacted traditional villages and the scattered settlements. The formations of the settlements are influenced by the geographical landscape. While the settlements formed in the mountainous (hill) sides are the traditional congested villages the scattered types of settlements are formed on the plain areas.

The first settlers of Konso clans

The first settlers in Konso society live in Dhokato town. Dhokato is a collective name for the three sister walled towns named lower Dhokato, Burquda and Hulme. Lower Dhokato is located a few hundred meters west of Karat town, capital of Konso Special Woreda Administration, and northern Konso-on the road to Jinka. Both Burquda and Hulme walled towns are located to the southwest of Lower Dhokato walled town. The Konso-Jinka road passes between Burquda and Hulme walled towns. Burquda walled town, which is separated from Hulme walled town by the Konso-Jinka road and a market place called Omboko, is located southeast of Hulme walled town and three kilometers west of Karat town. (Beyene, 2012)

The Konso population

According to population estimate by the Office of Statistics and Population of Southern Nations, Nationalities and Peoples' Regional State (SNNPRS), and the Central Statistics Agency (CSA, 2007), the Konso population projected for 2011 was 262,993. The population

had been formed in a number of smaller, organized, self governing and fortified villages, later transformed into towns.

The Konso fortified villages

They are located at About 50 kilometer south of Lake Chamo, in a bend of the Sagan River in the rift valley of southern Ethiopia, following a complex pattern of migration over the last thousand years, the first population formation in Konso as traditional way began. The Konso live in about 39 villages spread in a 650 square kilometer territory subdivided into three distinct regions; Garati in the east, Takati in the west and Turo in the north. As to (Capurro, 2012) , the Konso walled villages contains vernacular houses, households, walk ways, closed fences for every Individual residential compound *(Tikka),* public spaces *(Morra),* and small seating spaces formed under shades and communal footpath are located and respected for the Konso landscape. The Konso vernacular houses formation of the rural community is integrating with their culture and nature. The defensive stone walls are made several centuries around the villages of Konso neighborhoods. These defensive wall structures are called *Paletas*. The *Paletas* are not only one concentric ring stone walls; there are five up to six different stone walls. The *Paletas* are built layered of irregular basaltic stones constructed without any kind of mortar. The central *Palletas* are the first stone walls having a height of between 3.5 up to 4mt and a pedestal of 2.5 up to 2.8mt.

The Konso respected and responsible elders have more places in the transformation of Konso vernacular houses. Most of them are respected in the Konso society in terms of the social relation they developed among all villages and their homesteads. These types of social services are done under *Paffta* housing character and if it is strong case, go to the clan leader's residential compound and solve their problems in one of the Konso vernacular housing character *Agita.*

The elders are responsible to keep the Konso culture and its value under their leadership. One of their jobs is supervising the Konso housing character according to their cultural value and norms. Some of the Konso vernacular houses are transformed totally and others are partially transformed. The types of transformation are described by the Konso people elders in terms of their location, meaning and structure in their residential compound.

Under this chapter, the data gathered for the study is analyzed and interpreted being categorized in to two cases. The first case includes the fortified villages of Gamole, Dekato and Durayte. These wall villages are located near to the Zonal city called Karat. The second

case includes the fortified villages of Konao known as Gaho, and Fasha which are located far from Zonal city, Karat. These traditional wall villages that are suspected not to be exposed to influences of urbanization.

The *Morras* (Comunal oepen spaces)

The *Morra* is an open public space located within and outside the walled village of konso. *Morras* are accomedate a large number of population arround the nerest *kantas* in its open spaces called *Pahpaha.*

Morras are functionaly use for discusion very important cases in Konso population between *Poqolla* (clan leader), *Qimota* (the respected elders), *Porshitta* (Kanta leadrs), *Xella* (young and the generation in power) and the Morras are also serves as public assembly on the open spaces for solving some dispuite is occurred in their walled villages.
Morra is not only an open public spaces it has several elements located in *Morra*; the *Paffta* (public thatched roof housing unit),*Pahpaha* (the wide open public space), *Olahitta* (the generation pole), *Arumma* (the circular stone), flat stone and *Daka Dirumma* (the stone of manhood)

Picture 4.5a The Paffta comunal house is located in *MorraKuta*.

Picture 4.5b The *Pahpaha* the wide open public space

Picture 4.5c The *Olahitta* the generation pole.

Picture 4.5d The *Arumma* the circular stone

Picture 4.5e The *Daka Dirumma* the stone of manhood

Morras are several types and functionaly uses for each *Kanta* and sometimes morthan two *kantas*.

The morra Kuta is the respected Morra type they call it elder morra, Morra Kirba (Detatic Morra) uses fordansing serimony, Morra Gillenna is the respected Morra type for konso people it serves for traditional religious believer selebrate their belief seremony and Morra xaxa (Morra Jemoffe) is one type of Morra functionaly serves as a comitment to tell the trouth if some dispuite is happen in the konso indivigual person and additionaly uses for retual ceremonies every seve and eleven years during the transfer of power from the oldd generation to the new young generation.

4.5. TYPICAL RESIDENCIAL COMPOUND (TIKKA) FORMATION OF KONSO

The Konso residential compounds are located at the hill sides and mountainous areas. All of them are parceled in two parts. The upper part of the compound is called *Oyeta* and the lower part of the compound is *Arahata.*

Oyeta is functionally uses for built the sleeping huts and in some parts storage functional huts are built. This type of thatched roof housing units are purposively construct in upper part of the compound *(Oyta)* because of to protect from attacking the thatched roof of housing units by the horn of the cattle. All of the *Oyetas* areas are lesser than *Arahatas.*

Arahata is serves as functional spaces for the residents, built the thatched roofing storage functional housing units, service functional houses and shade houses are built in this compound. The Konso people create the two special compounds according to the site condition it means respecting to the landscape. The Konso vernacular houses are built according to chronological order in the *Oyeta* and *Arahata.*

The main entrance and exit door *(Harra)* is located in the *Arahata* compound space. All most all of the residential compounds have fences in four sides, the dray stone fences have an average of 60cm.height and constructed without mortar. On the top of the dray stone fence the wooden fence constructed with the height of an average.

CHAPTER FIVE

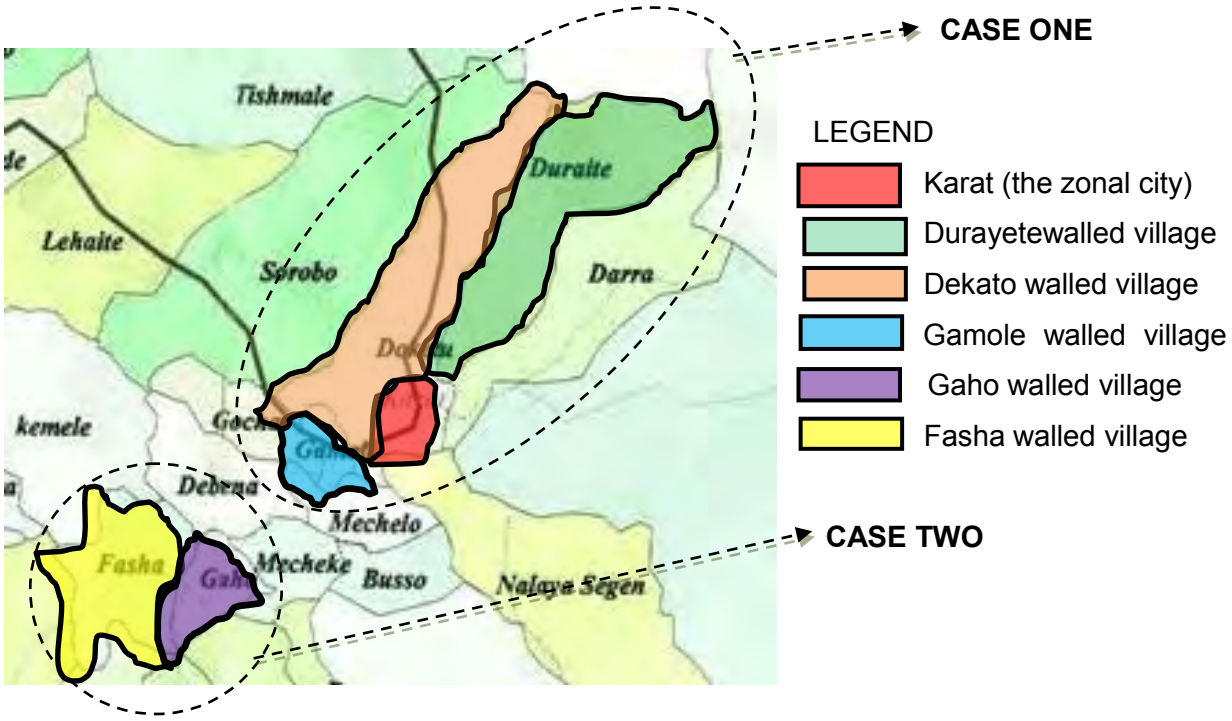
CASE STUDY, ANALYSIS AND INTERPRETATION

CHAPTER FIVE

CASE STUDY, ANALYSIS AND INTERPRETATION

5.1. INTRODUCTION

The information is organized and presented in line with the basic research questions. Then, it is analyzed using sketches, maps, pictures and tables for which interpretation was given bit by bit.



Map 5.3 Enlarged mapping of the case location areas under cluster of Karat and Fasha, showing the two case study locations categorized in two clusters and each having its own walled villages.

CASE ONE

This case study covers three walled villages *(Palletas)* located near the zonal city of konso called Karate. The three walled villages are Gamole, Dekato and Durayte.

5.2. ORIGINAL KONSO VERNACULAR HOUSING CHARACTER, FUNCTION AND THEIR MEANINGS.

Konso vernacular houses are divided into three major parts: (1) those which serve as a storage housing character like *Kossa, Alita kossa, Reqa,* and *Agita*: (2) housing characteristics that serve as living cottages like *Manna* and *Elfennotta (Elphign): and (3)* social service housing character called *Paffta* that is located only in open communal spaces known as *Morra.*

According to the konso elders, most of the walled villages *(Palletas)* are located at the hill side or mountainous areas because of three major reasons. The first reason is that hills have good strategic place to prevent external forces. In the second place, it can prevent flooding. It can also help them protect themselves from sicknesses like yellow-fever.

Ato Robo described Konso vernacular houses in time and location. He pointed out that there is an order in which the houses are built. The upper part is residential compound and locally known as *Oyeta*. The lower part is used for keeping cattle and for doing household chores. This segment is known as *Arhata.* By way of shoing the changes that vernacular housing characters have undergone, Ato Robo noted that most of the totally transformed houses are covered on the top by corrugated iron sheet roof material. These transformed houses are constructed in the *Arhata* residential compound space called *Tikka.* Originally, the residential homes like *Manna, Elphign* and *Kossa* are built at the upper level of the homestead. That is *Manna* and *Elfennotta (Elphign)* are protected from the reach of the cattle. (There is a belief that head of the household will die if an an ox tramples with Manna and Elfign.)

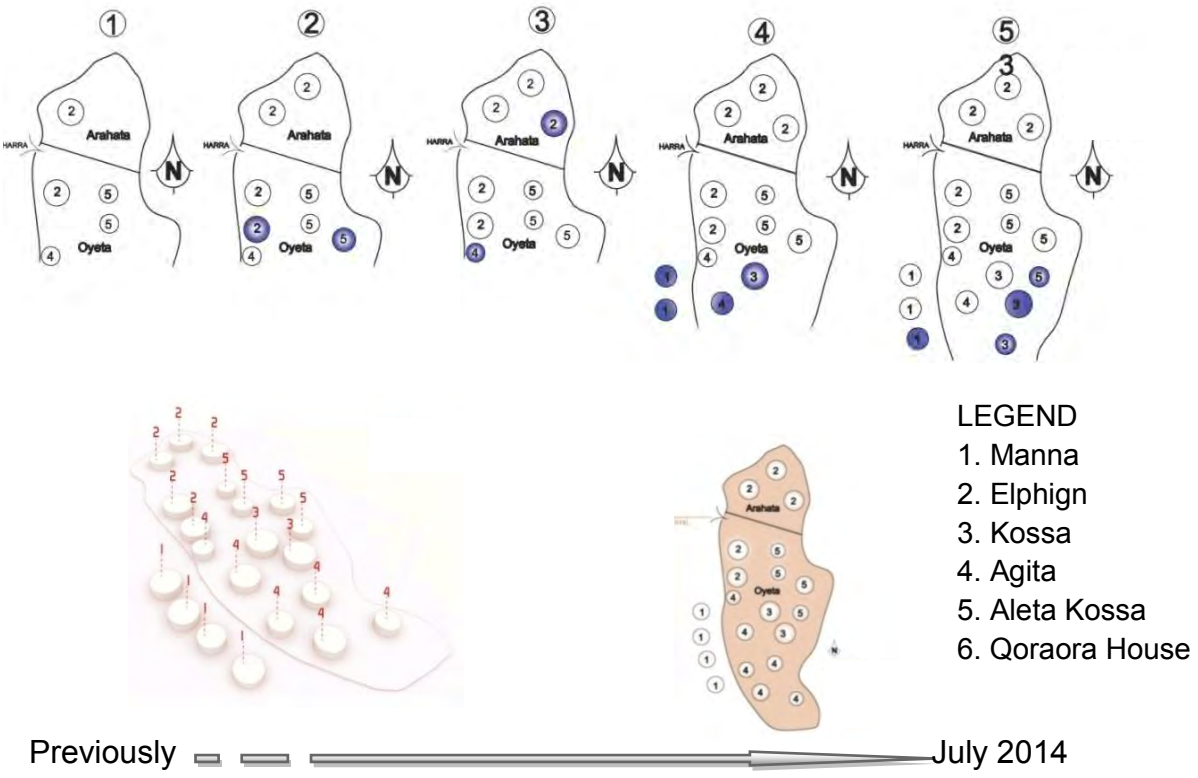
Picture 5.6 Kalla Gezaghn W/dawit

Life history

Kalla Gezaghn is one of the regional clan leaders *(Poqullas*). His residential compound *(Tikka)* is located in Gamole walled village. He is from the *Poqullas* family – a family that belongs to *Kantayata* clan. He is 48 years old and married, with three children. His *Tikka* is located at the strategic hill side of Gamole walled village. Kalla Gezahgn got his residential compound from his father. His *Tikka* is

constructed at the top of a hill and doesn't have any neighbor. In Konso society, the *Poqulla's Tikka* is located separately, far from other people.

Kalla Gezahegn is not merely leading his own clan. On top of this responsibility, he is also the king of the Konso. He was kind enough to agree for my interviews. He owns 21 thatched roof konso vernacular houses in his *Tikka*. All the housing characters that ordinary people build are also built within the compounds of clan leaders. The only exception is *Agita*, which is built only in the compounds of clan leaders. At the southern part of his *Tikka* there is wide flat green meadow that is used for annual ceremonial events of Konso people. There are also trees and farming plots with typical Konso terracing around the *Tikka*.



Sketch 5.1 Sketch analysis of vernacular house in Kalla Gezaghn's residential compound (Tikka).

Engulla (storage)

Partial view *of Kossa*

Partial view of *Reqa*

Internal gate *(Harra)*

Arima Poqolla

Main Compound entrance (Harra)

Picture 5.7 Shows the main entrances of compound *Harra*, the internal circulation path, partial view of the thatched roof houses, the storage bamboo baskets *(Engulla)* and working space under the *Reqa* and the preserved stone setting space *(Arima Poqolla)*only for Kalla Gezagnh

AGITA* and *MANNA

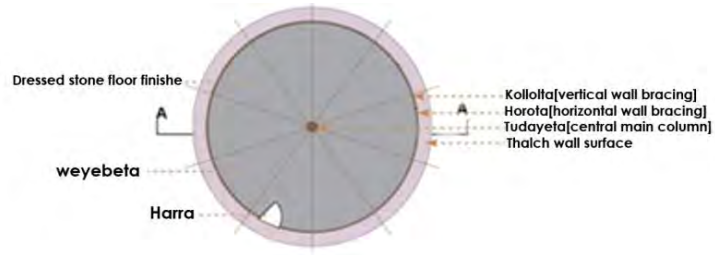
According to Kalla Grezahan's description, *Agita* and *Manna* vernacular houses have similar architectural façade. Both houses are constructed with thatched roof and wall surfaces, having one small sized exit and entrance door *(Harra). Agita* and *Manna* are different in function and interior spaces. *Manna* has spatial architectural functional places located on the ground floor level.

AGITA

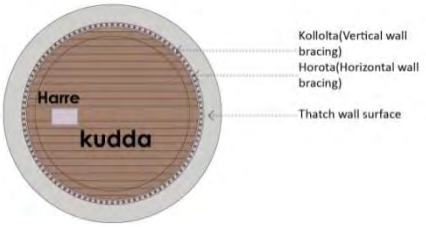
Agita has two floor levels with different spatial functions. Their spaces are located at ground floor level and on the upper floor level with different uses. The upper floor level is supported by four columns called *Tudayata* and it creates a secret spatial storage functional room

called *Kudda*. Because of the presence of *Kudda*, these types of Konso vernacular houses are called *Agita. Agita* is constructed only in the residential compound *(Tikka)* of clan leaders *(Poqulla* or *Baletumma), Agitas* have several functions. They serve as arenas for traditional religious rituals, as sleeping space for the clan leaders and their wives, as waiting space for the corpse of the king and his mother. *Kudda* is used for storage function. *Agita* is constructed using wood especially for columns, flooring beams, the elevated floor finish, roofing beams, and inclined supporting roof bracing materials. Grass is used for making the two types of roof surface, namely the upper surface of the roof *(Kekisha)* and the lower part of the roof surface *(Kabema).*

AGITA

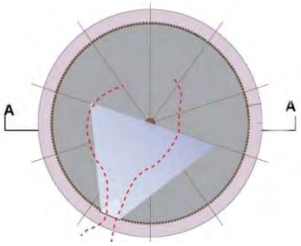


Ground Floor Plan *(Weybeta)*

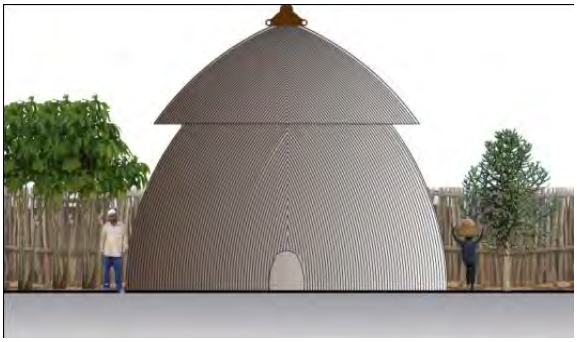


First Floor Plan *(Affda)*

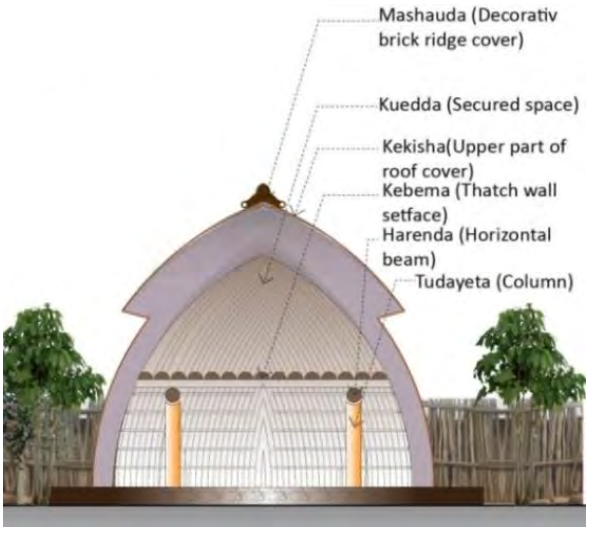
Lighting and Pathway in *(Affda)*



Lighting and Pathway in (weybeta*)*



Elevation of *Agita*

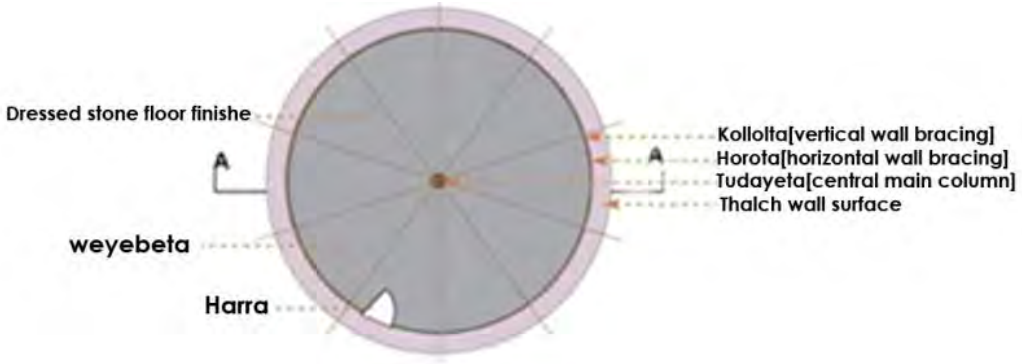


Section of *Agita*

Figure 5.2 Graphical analysis of Agita vernacular house

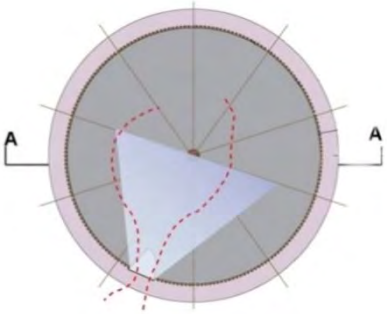
MANNA

According to Kalla Gezaghn, Manna is constructed like *Agitas* with thatched roof and wall surface an average of 60cm wall thickness and only has one floor level built on the upper ground floor level of *Tikka* which is called *Oyeta. Manna* has three functions. It could be used to house a woman who just give birth to a child, to prepare local beer *(Cheka)* and as a a sleeping place for the head of the household and his wife. Manna houses are constructed in order to withstand the hot climate of the area.

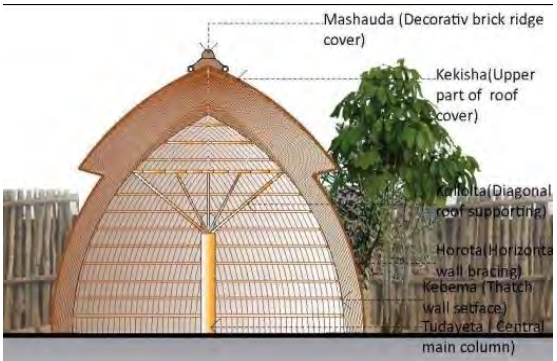


Ground floor plan (*Weyebeta)*

Elevation of *Manna*



Lighting and Pathway in *Weyebeta*



Section of *Manna*

Figure 5.3 Graphical analysis of *Manna* vernacular house, showing the floor plans, elevation, section, natural lighting and pathway of *Manna*

Picture 5.8 Ato Gilelo Kesis Interviewee from Gamole walled village.

Life history

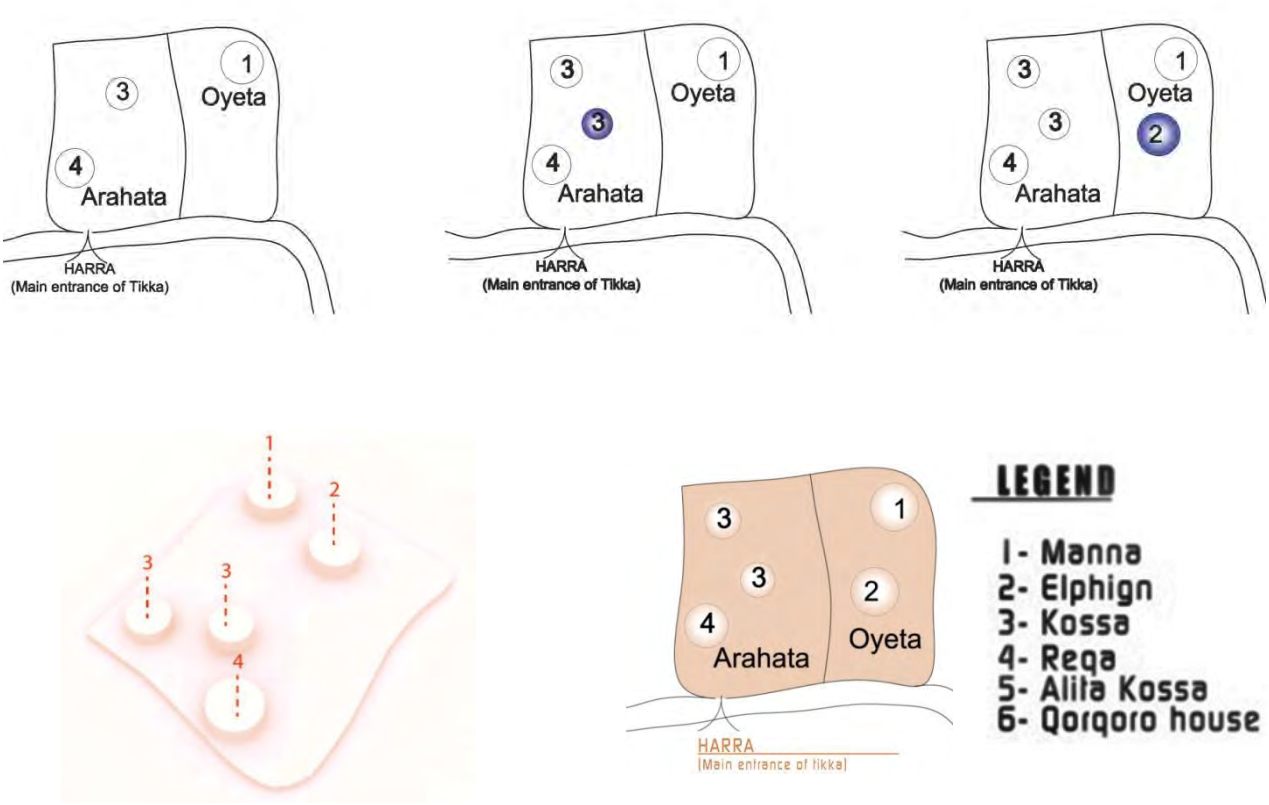
Ato Gilelo Kesis is one of the Konso respected elders and representative of Kalla Gezahegn. He assists the performance of several traditional social services in Gamole walled village. Ato Gilelo is 65 years old and married. His residential compound *(Tikka)* contains five housing unit in Oyta and Arehata built according to chronological order. He describes mainly about Kossa and Elffennotta (Elphign) vernacular housing character. Ato Gilelo is the first son of the family; he had a chance to receive his house and Tikka directly from his family according to Konso culture.

***KOSSA* and *ELFENNOTTA* (*ELPHIGN*).**

Ato Gileo described the *Kossa* housing character which is mainly used for storage – storing mainly maize and other crops in the upper floor level. Under the raised floor level *Kossa* has special usage for shading of domestic animals. *Kossa* is built in both of the upper and lower part of the *Tikka*. Ato Gilelo says that most of the Konso people, including him, owns more than one Kossa in a *Tikka* depending on the status of their wealth.

Ato Gileo inherited the place with Kossa, Manna, and Reqa from his parents. Because of the Reqa was not a good condition he had to maintain it. And due to the increase of the size of his family, he had to build storage and sleeping housing units.

The *Elfennotta (Elphign)* house wall is constructed by using mud & wood with 1.6 m. wall height to be used for sleeping function of children and their parents. *Elfennotta (Elphign)* is constructed on the elevated ground surface of Konso residential compound *(Tikka).*



Sketch 5.2 Sketch of vernacular houses located in Ato Gilibo's residential compound *(Tikka)*

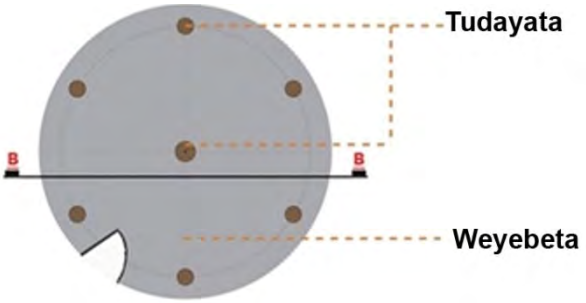
Partial view of the Tikka

Manna

Harra

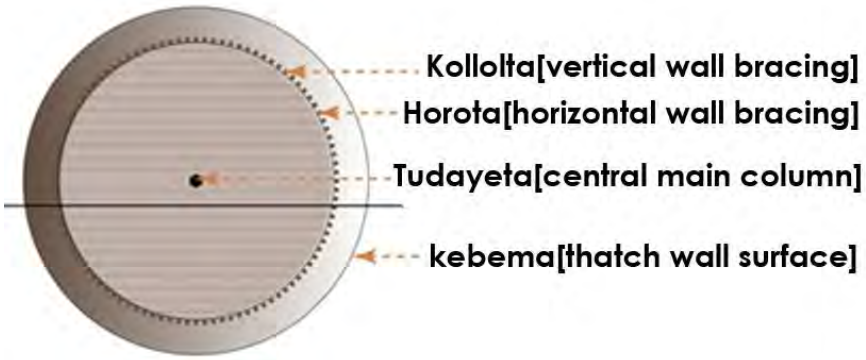
Picture 5.9 Pictorial analysis of residential compound of Ato Gilebo Kesis, depicting partial view of the compound, main entrance and exit door *(Harra)* to and from *Elfennotta (Elphign)* picture..

KOSSA



Ground Floor Plan *(Weyebeta)*

Section of Kossa

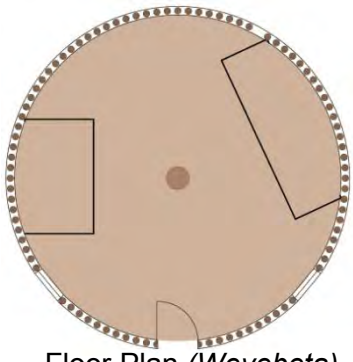


First Floor Plan *(Affda)*

Elevation of Kossa

Figure 5.4 shows the storage functional graphical presentation of Kossa vernacular house.

***ELFELPHENNOTTA* (*ELPHIGN*)**



Floor Plan *(Weyebeta)*

Elevation and Section of *Elfennotta (Elphign)*

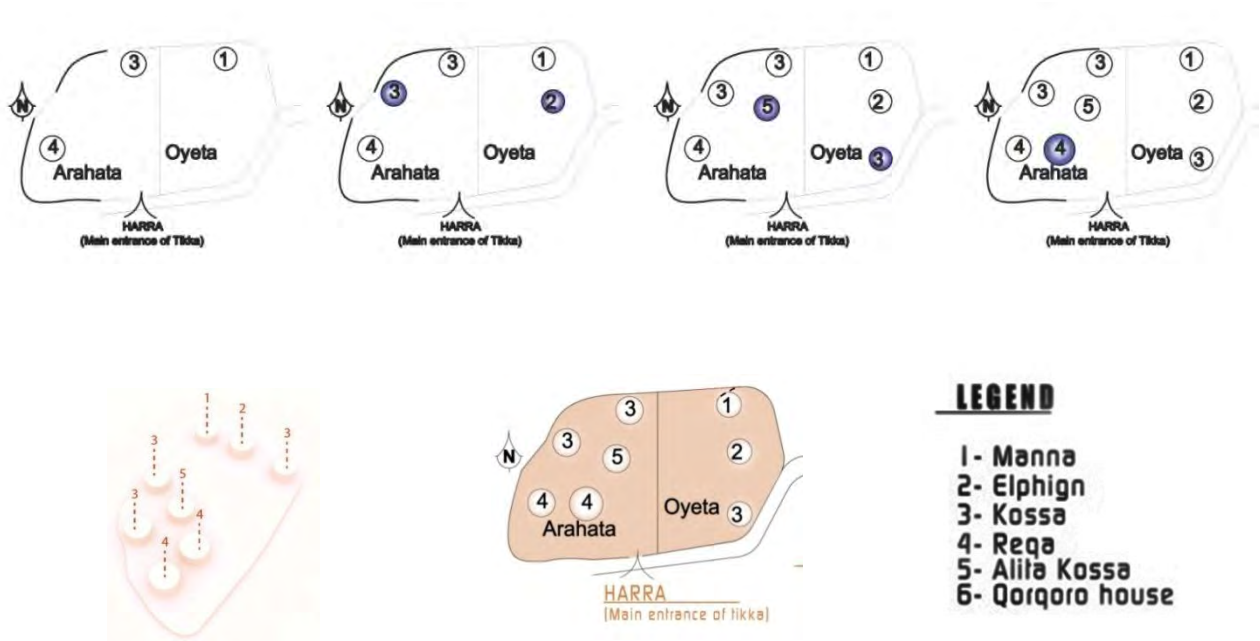
Figure 5.5 Graphical analysis of *Elfennotta (Elphign)* vernacular house.

Picture 5.10 Ato Robo Ketete from Gamole walled village.

Life history

He was born in Gamole *Palleta* (walled village) and he is 80 years old. Ato Robo is the second boy of his family and he got his residential compound and three Konso vernacular houses made by his father around his parent's residential area. Robo is now and for some years in the past one of the much respected elders in Konso society. He is for example the first selected elder man in Gamole. He has grown up children who are all married. Ato Robo has deep understanding of the Konso culture and the meaning of konso vernacular houses. He is well conversannt on the nature of most of konso vernacular houses, their meanings and functions like *Paffta* (community house), *Manna* (maternity house) and *Reqa* (one of the storage konso housing character).

Ato Robo built additional konso vernacular houses such as Kossa, *Reqa* and *Alita Kossa* of storage functional houses and *Elphign* (sleeping housing unit)



Sketch 5.3 Sketch analyses of vernacular houses located in residential compound *(Tikka)* of Ato Robo Ketet.


Harra

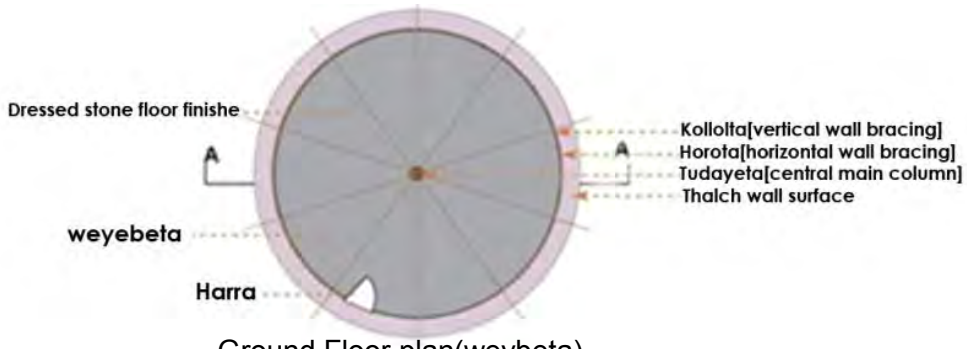

Old and new Kossa


Rear part of the compound

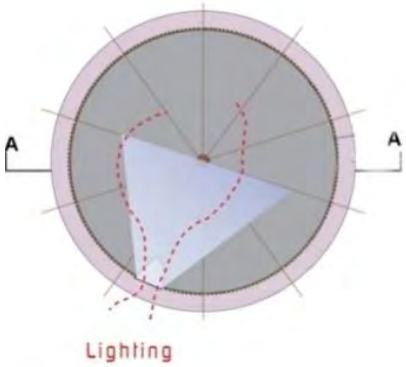
Picture 5.11 Pictorial analysis of residential compound of Ato Robo Ketit, describing partial view of main entrance and exit door *(Harra)*, backyard of the compound, and internal part of old and new *Kossa* outlook.

MANNA

Ato Robo described *Manna* housing character thus: *Manna* is constructed in all konso society residential compounds *(Tikka). Manna* has an average of 60 cm thick thatched roof and wall surface, constructed on the *Oyta* floor level. Manna has several functions, mainly used as maternity housing unit, preparation of *Cheka* (local Beer) and resting house for head of the household. *Manna* serves as space to entertain the guests of the head of the household. Apart from this, *Manna* houses are used to regulate the temperature.



Ground Floor plan(weybeta)



Lighting and Pathway in *Weyebeta*

Elevation of *Manna*

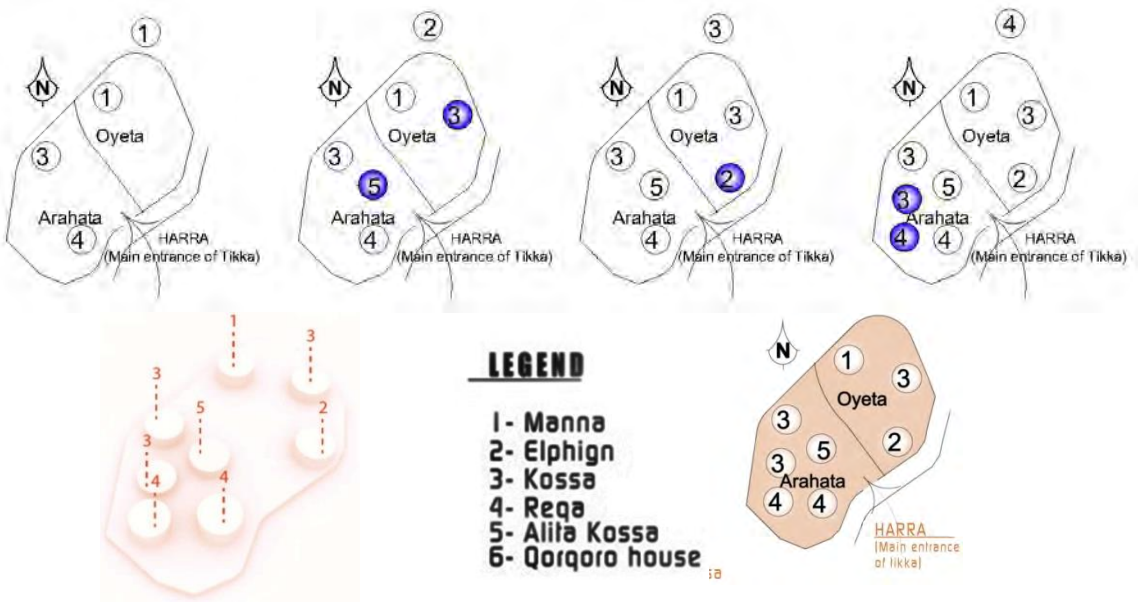
Sectional view of *Manna*

Figure 5.6 Graphical analysis of *Manna* vernacular house.

Picture 5.12 Ato Otoma Kuddado from Durayete walled village.

Life history

Ato Otoma Kuddado, a 65 years old farmer, housing expert and elder in his *Kanta*. He has constructed a lot of houses in Durayete. Ato Otoma is a second son of his family; he also got the residential compound and farming land according to Konso land authentication system – a system that is operated by traditional structured group composed of *Porshetta, Emyebeleta* and *Hella*. Ato Otoma is a married person and has grown up sons and daughters. All of them are married. He has a strong outlook with regard to keeping the culture of Konso. Ato Otoma is a strong farmer and built additional two *Kossas* at a time when his family size increased. He also built additional new Konso vernacular houses like *Alita Kossa, Reqa* and *Elfennotta (Elphign)* in his *Tikka.*



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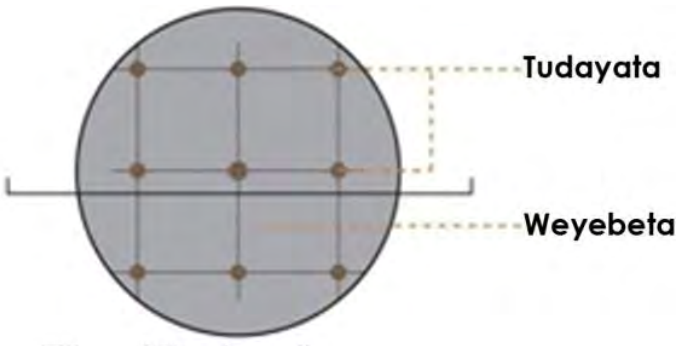
Sketch 5.4 Sketch analyses of vernacular houses located in residential compound of Ato Otoma Kuddado.

Walled Kossa | Partial view of Elephign | Old Kossa | Harra

Picture 5.13 Pictorial analysis of residential compound of Ato Otoma.

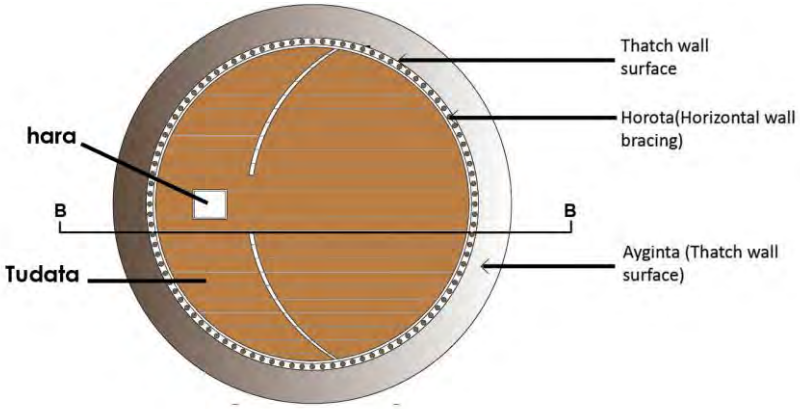
REQA

Ato Otoma had also described the *Reqa* housing unit, which is located in all of the Konso residential compounds and it is constructed on the lower level of the konso residential compound *(Arhata). Reqa* has a storage space which is managed by the father of the family. It is constructed with major local building materials such as wood and grass. Wood is used for columns, supporting beams of roof and the raised floor surface and floor finish. The lower and upper roof surface is built by grass. The lower part of thatched roof surface *(Kabema)* and the upper part of the thatched roof surface is called *Kekisha*. Rope is made from grass and animal skin, which are used to tighten the bundle of grass that forms the roof.

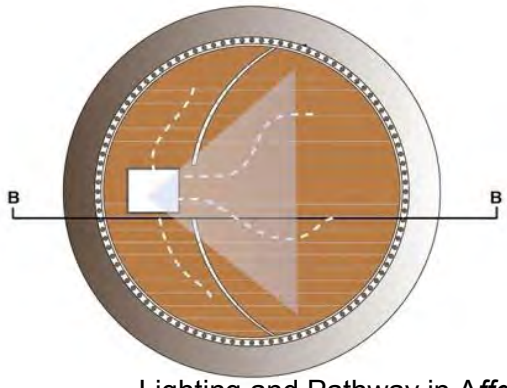


Ground Floor Plan *(Weyebeta)*

Elevation of *Reqa*



First floor plan of (*Affda*)



Lighting and Pathway in A*ffda*

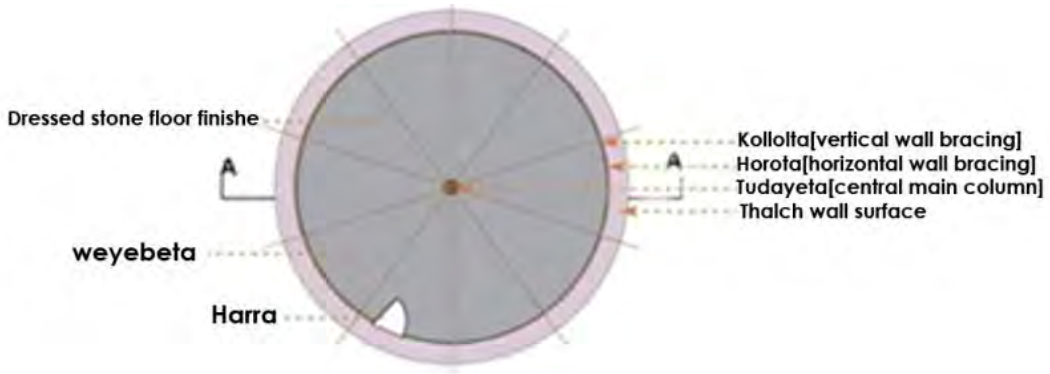
Sectional view of *Reqa*

Figure 5.7 Graphical analysis of *Reqa* vernacular House.

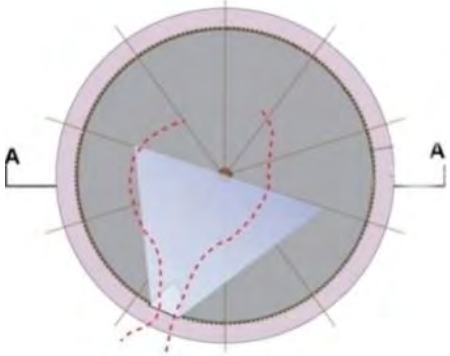
MANNA

Ato Otoma described the ways in which several housing characters of the Konso are constructed. By way of showing how house construction in Konso is deeply intertwined with the Konso culture, Ato Otoma presented the case of the *Manna* housing unit which is the most important housing unit among the Konso. *Manna* is built mostly by or for the second born person of every Konso family. The *Manna* house unit is built on the upper part of *Tikka* in the compound. The construction involves steps such as collection of local building materials, positioning of the central pillar (which is wooden), digging of the hole for the pillar,

reinforcing the pillar, raising the wooden wall surface, reinforcing the wall by horiizontal bracing, and, finally, installing the thached roof (*Kekisha*) and wall surface (*Kembeba*). *Manna* is functionally used as sleeping space for husband and wife, maternity services and *Cheka* preparation. *Manna* has one small exit and entrance door *(Harra).*



Ground floor plan (*Weyebeta)*



Lighting and Pathway in *Weyebeta*

Sectional view of *Manna*

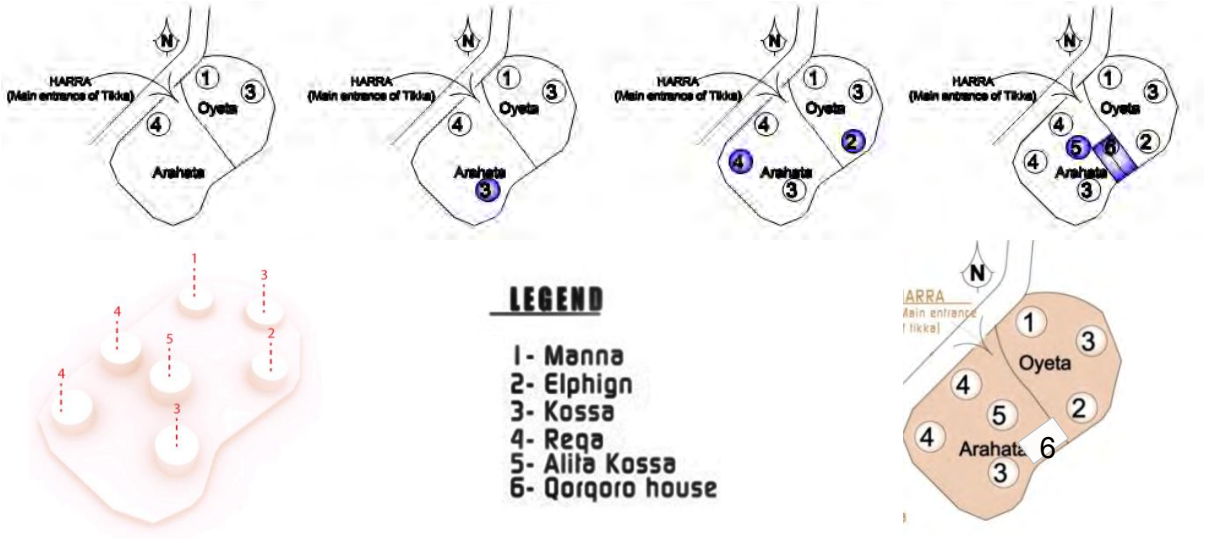
Elevation of *Manna*

Figure 5.8 Graphical analysis of *Manna* vernacular house.

Picture 5.14 Ato Gelebo Kumere Boyelle from Dokato

Life history

Ato Gelebo kumere Boyelle was born in Gamole walled village (Palleta) but he got married and is living in Dokato. He has grown up children, who are all married. He is 68 years old man and a respected elder. Ato Gelebo is a housing expert in Dekato. Ato Gelebo got the major three houses, *Manna*, *Kossa* and *Reqa* from his father and he added four konso vernacular houses because of the growth of his family size in time. His first son built a rectangular Qorqoro house like some of his fellow Konso first-born boys. Ato Gelebo's expose focused on Paffta, communal house of Konso.



Sketch 5.5 sketch analyses of vernacular houses located in residential compound (Tikka) of Ato Gelebo kumere.

Main entrance *Harra*

Kossas in the Tikka

Cattle shade under *Reqa*

Qorqoro house

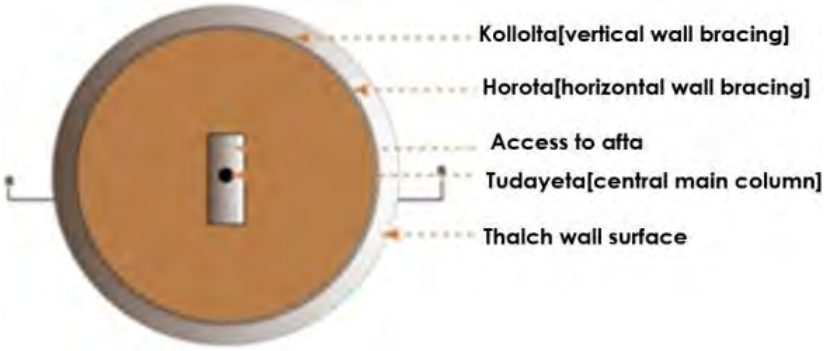
Picture5.15 Pictorial analysis of residential compound (Tikka) of Ato Gelebo Kumere describes for us the main entrance *(Harra),* the totally transformed Qorqor house built by his first son, the *Kossa,* and the cattle are shade under the raised floor of *Kossa.*

PAFFTA

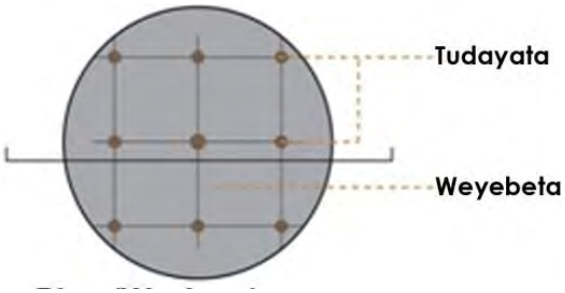
Ato Gelebo mentioned about *Paffta* housing character that is located in konso walled villages. He said at first all *Pafftas* were built on an open public space called *Morra.* Describing about Morra Ato Gelebo said they were mostly located in good strategic place to watch their enemy systematically. Each walled village *(Palleta)* is built having an open space for annual events like their own New Year celebration and dancing. So *Paffta* (communal house), *Oayta* trees (generation grade tree), *Lakeda Gudita* (sitting space) are all built in different type of *Morras*. Among the konso vernacular houses the Konso people have *Paffta* (communal house) which were built with the capacity of the society under the coordination of the traditional leaders and elders.

Though *Paffta* construction methodology or process is not different from other Konso vernacular houses. Its construction takes place according to the program set by the society beginning from collecting local building materials to involvement of construction experts, elders, and religious leaders. *Pafta* is the communal house having several functions, including as a place where Konso elders sit on some serious cases that happen between the dwellers and neighboring *Palletas*. They also use the place to measure the fitness of Konso youngsters by making them lift different weight of circular basalt stones. Unmarried young boys use the space to watch over the respective walled villages over the night from fire, theft, any aggressors and wild animals.

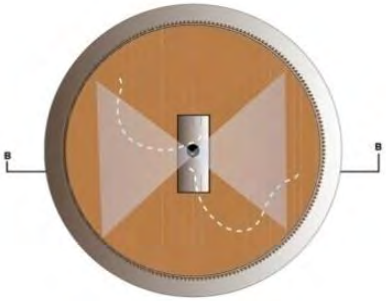
Paffta has two type of thatched roof style. The first is the upper part of the thatched roof cover which is called while the second type is the lower thatched roof cover which is *kebema. Paffta* also has roof edge cover produced from brick called *Mashauda.*



Ground Floor Plan (*Weybeta*)



First Floor Plan (*Affda*)



Lighting and Pathway in A*ffda* floor level

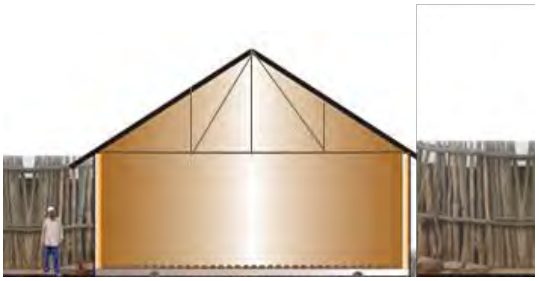
Sectional view of *Paffta*

Elevation of Paffta

Figure 5.9 Graphical analysis of Paffta vernacular house. Show the *Paffta* floor plans uses for elders' judge under the shade of *Paffta* called *Weyebet*a space and the young unmarred Konso dwellers slipping in the upper floor level called *Affda* space. There are some explanation for the elevation, section and natural light distribution and pathway in graphical presentation.

QORQORO RESIDENTIAL HOUSE

Ground floor plan



Sectional view of Qorqoro house

Lighting in Qorqoro residential house

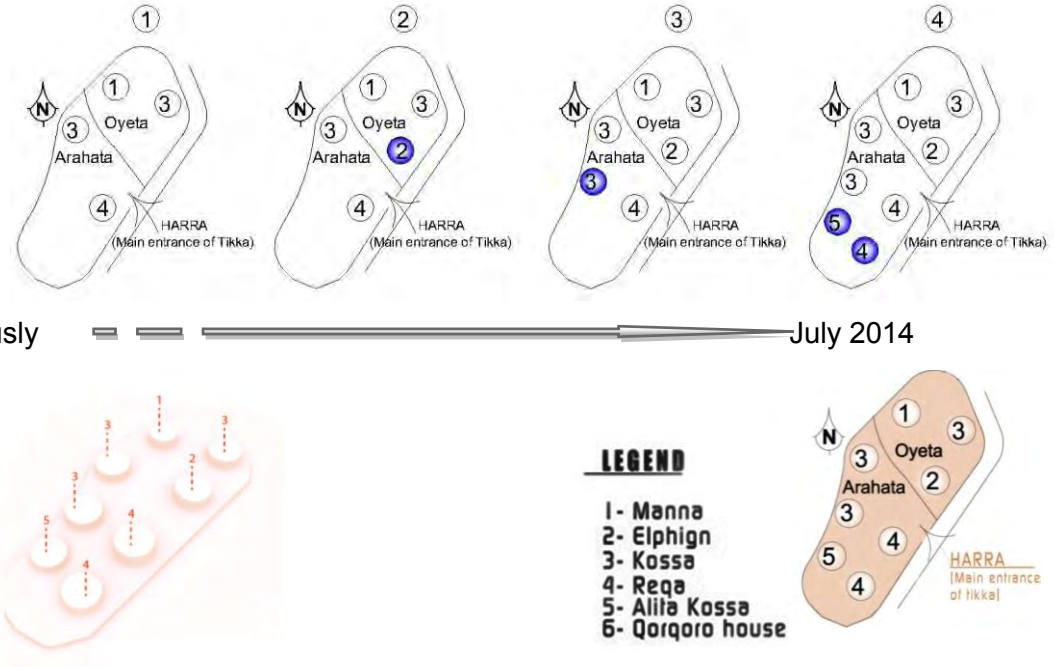
Elevation of Qorqoro house

Figure 5.10 Graphical analysis of Qorqoro residential house.

Picture 5.16 Ato Kedido Delibo Interviewee from Gamole walled village

Life history

Ato Kedido Delibo is one of the respected elders in Konso; Kedido has more knowledge about Konso vernacular housing characters and their meanings. He is a 68 years old man, farmer and one of the elders from Gamole. Kedido is the first boy of his family. He was living in his parents' residential compound (*Tikka*) while he was a boy. Ato Kedido talked on several housing characters of Konso vernacular houses, especially *Manna*, *Kossa* and *Paffta* - housing characters highly valued by Konso population.



Sketch 5.6 sketch analyses of vernacular houses located in residential compound *(Tikka)* of Ato Kedido Delibo.

Harra *Reqa* *Elphign*

Picture 5.17 Pictorial analysis of residential compound of Ato Kedido Delibo.

MANNA* and *KOSSA

Ato Kedido mainly discussed the *Manna* and *Kossa* housing characters. The words he gave me does not have much difference with what has already been said about the two housing characters. As elsewhere said, Kedido said almost the same thing regarding the construction method of the roof structure, building function, materials used for construction and building location of the units.

MANNA

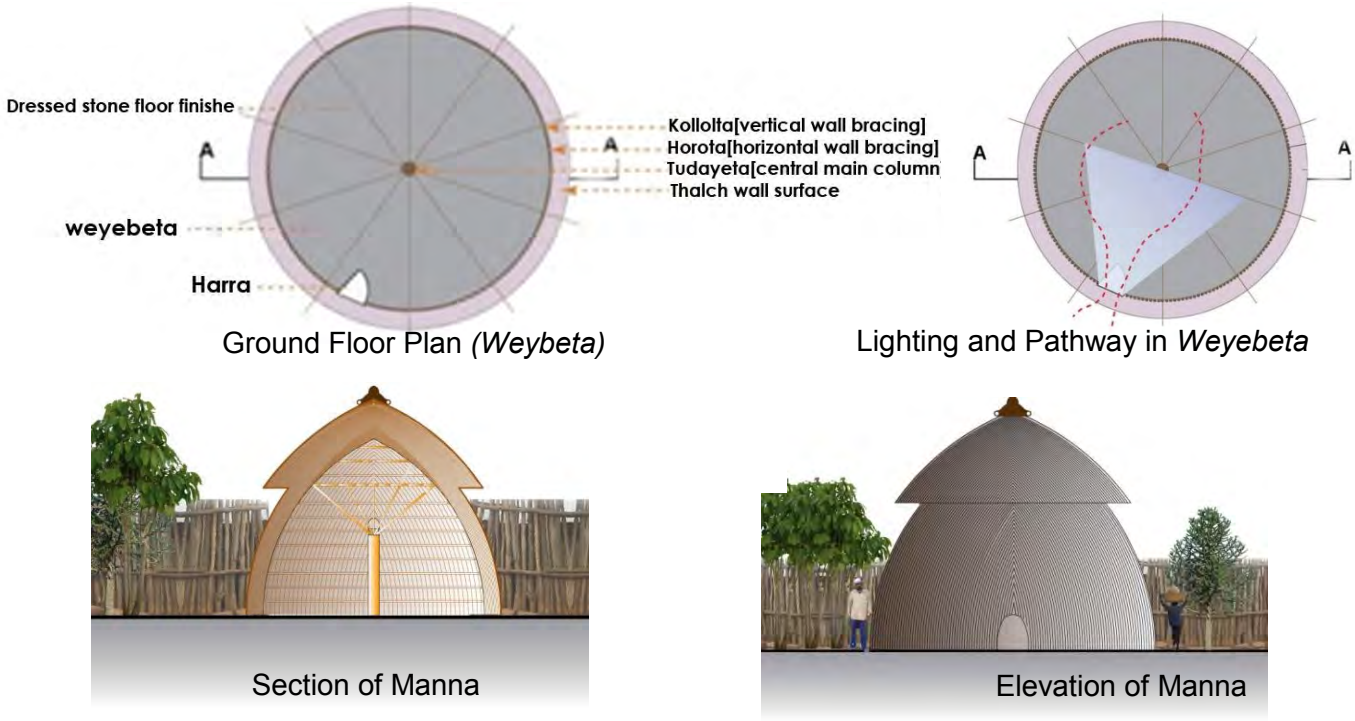
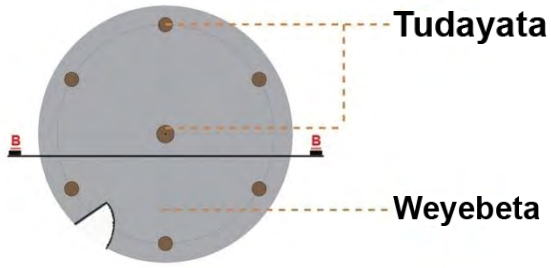
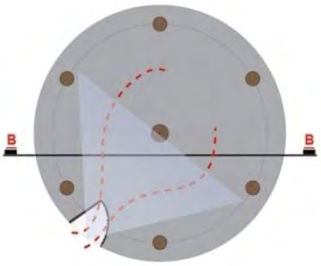


Figure 5.11 Graphical analysis of *Manna* vernacular house.

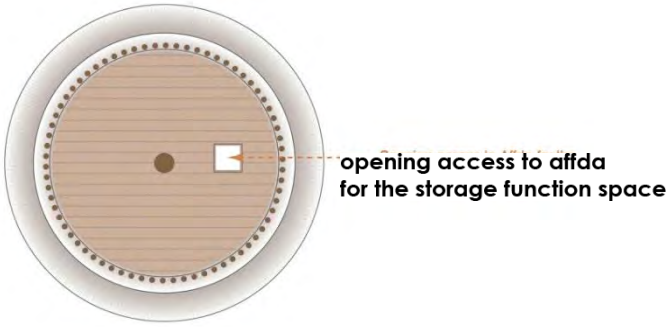
KOSSA



Ground floor plan *(Weybeta)*



Lighting and Pathway in *Weyebeta*



First floor plan *(Weybeta)*

Lighting and Pathway in *Affda*

Elevation of *Kossa*

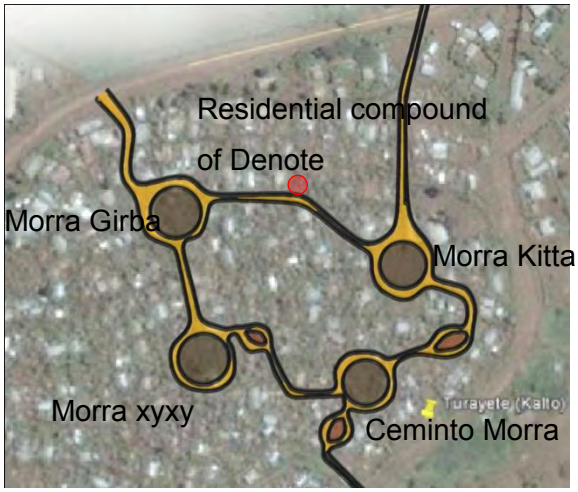
Sectional view of *Kossa*

Figure 5.12 Graphical analysis of Kossa vernacular house.

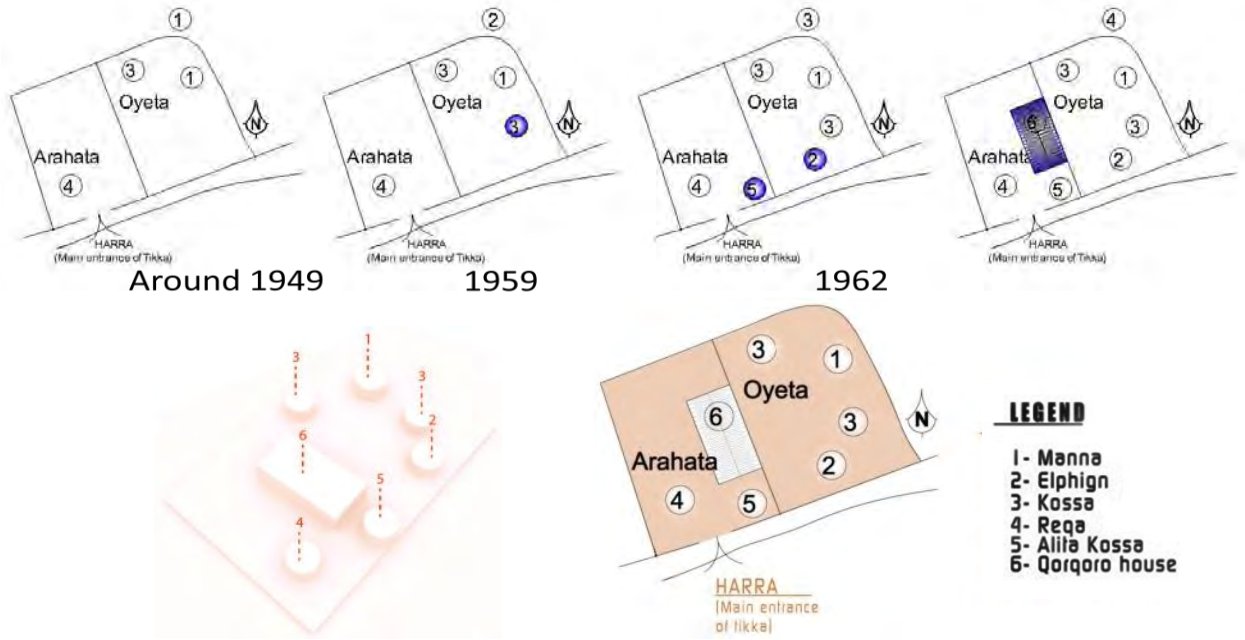
Picture 5.18 Ato Dinote Kusia Shenkere from Durayite walled village

Life story

Ato Dinote Kusia Shenkere is 65 years old. Formerly, he was a teacher and now he is working in Konso Culture and Tourism Office. He is a respected elder in the Konso society. Ato Denote has good knowledge of the history of Konso. Denote is the first son of his family and he was living in his family's *Tikka*.Then he inherited one residential compound from his family. In his *Tikka* he has K*ossa, Reqa*, *Alita Kossa* and one rectangular Qorqoro residential house constructed 35 years before at the lower level of his residential compound *(Arhata).* Additionally, he constructed a Qorqoro house to manage his family that was growing in size. The transformed Qorqoro house has two levels. The upper level is used for sleeping, dining and a small area of it is used as a book store. The lower level is used for storage of farm products, house hold goods and shelter for cattle. Denote and his families are the followers of Orthodox Christianity. He is living in Durayte with his wife and small children.



Sketch map of Durayete walled village



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Sketch 5.7 sketch analyses of vernacular houses located in residential compound *(Tikka)* of Ato Denote Kusia. The houses were constructed within a long period of time but within the same compound.

Manna

Kossa

Elphign

Morringa is prepared for diner

Qorqoro residential house

Picture 5.19 Pictorial analysis of residential compound *(Tikka)* of Ato Dinote Kusia.

REQA

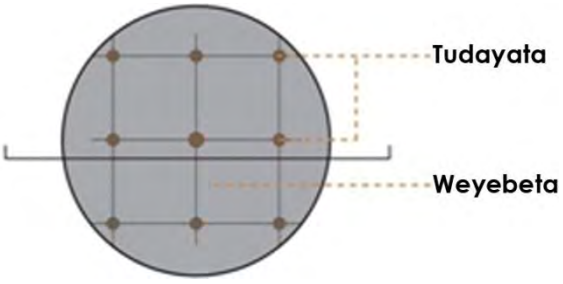
As said*, Reqa* is located in all of the Konso residential compounds and it is constructed on the lower level of the konso residential compound *(Arhata). Reqa* has three special architectural spaces: the ground floor level is used as storage facility for crops, local beer *(Cheka)* preparation and sleeping or sitting space for grandfather of the family. The upper floor level has two architectural spaces *Tudata* and *Arhita. Tudata* is used as a storage space of milk, boiled grain and a different snack a farmer eats immediately after he is back from the field and before dinner is served. Also serving as a secret storage for the head of the household, *Arahita* is functionally used for storage facility for selected food products like smoked and dried red meet called *Hayeda,* and boiled and grilled meat, honey and Butter.

Reqa is the storage housing character of the Konso society which is administered by the father of the family. It is constructed with wood for building columns, flooring beams, floor finish, roofing beams, and inclined supporting roof bracing materials. Grass is applied as a construction material to the two types of roof surface. Rope is made from animal skin, grass, or bark of local trees. It is used to tighten every connection of wooden joints. Stone is very important building material easily available in Konso and used for floor finish and unmortared masonry foundation and for resting or sitting space under shade areas.

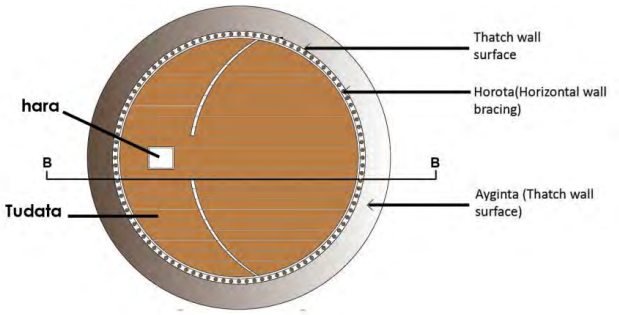
Reqa is the sign of fraternalism in Konso culture. The main function of *Reqa* housing character is to be used as storage of special and respected goods. It is Ato Denote who is allowed to take out the goods stored in *Reqa* because of his authority as the owner and head of the family. By virtue of this, *Reqa* symbolizes the father of the house. At times the

word “Reqa” could mean Father. The head of the household (the father) has an exclusive right for Reqa even under circumstances that involve dispute between neighbors. (Among the Konso, a traditional court does have the right to impose a temporary ban on one’s property whenever there is some kind of charge. Elders do not have the right to impose such a ban on reqa, though.)

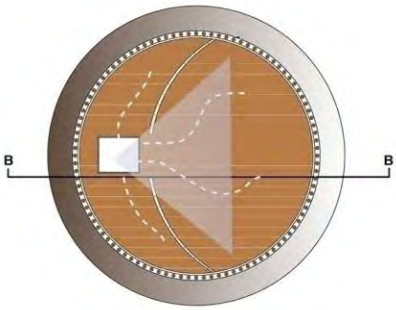
REQA



Ground floor plan *(Weubeta)*

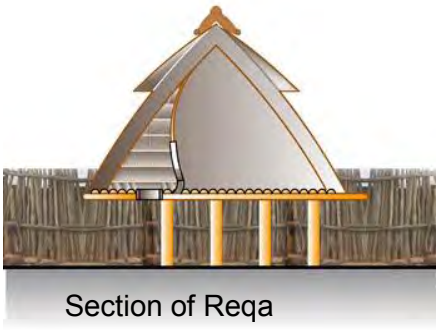


First floor plan *(Affda)*



Lighting and Pathway in A*ffda* floor level

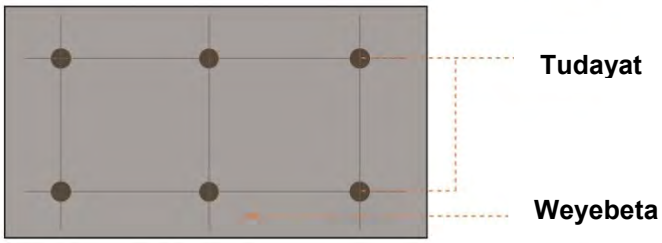
Typical elevation of Reqa



Section of Reqa

Figure 5.13 Graphical analysis of Reqa vernacular house.

QORQORO RESIDENTIAL



Ground floor plan (Weybeta)

First floor level of Qorqoro

Lighting and Pathway in First floor level

Sectional view of Qorqoro residential house

Left side view of Qorqoro residential house

Figure 5.14 Graphical presentation of Qorqoro residential house, showing the nature of the lower floor level, which is used for storage for farm products, household goods and shelter for cattle whereas the upper level is used for sleeping, dining and a small area of it is used as a book storage facilities. The Qorqoro house is built on the lower level of the compound called *Arhata.*

UDDA (***SONNGA***)

The *Udda* housing unit is built in the entire Konso area. Constructed in the lower part of the *Tikka*, *Udda* is functionally used mainly for food preparation, traditional hand-made seed grinding and processing housing unit and storage of dry firewood. The roof surface is thatched and it is supported by a vertical rounded wood column (Tudata). Its wall is built by local building materials such as vertical wood pine. The second half of the wall – the segment thatm reaches the ground – is mud plastered while the floor is stone finish. The windows and door are made up of timber.

***UDDA* (*SONNGA*)**

Figure 5.15 Graphical analysis of *Udda (Sonnga)* vernacular house, which is used as kitchen facility, and as a space for doing household chores.

5.3. SUMMARY OF FOCUS GROUP DISCUSSION WITH KONSO ELDERS

The focus group discussion carried out by elders had seven participants. Kalla Gezahegn, a clan leader and a king of Konso as a whole, led the discussion. The topics incllude vernacular housing characters in konso, their building location, chronological order, building material, form of the building and the symbolic meanings of the vernacular houses.

Ato Robo, an elder and one of the participants of the focus group discussion, talked about *Paffta, Manna and Reqa*. As he already said when interviewed separately, Ato Robo reminded us that *Paffta,* as a communal housing character, is built on the communal open space called *Morra*. It has two floor levels functionally used for the community. Elders sit under the shed of the *Paffta* to undergo jurisdiction.He also noted that the *Paffta* serves as a command post.

Ato Gelebo kumery add about the functional usage of *Paffta* and *Manna*; *Paffta* uses for sleeping function for unmarred young konso dwellers and, as said elsewhere, these young people use it to watch their village during the night.

Ato Kedido on his part described *Kossa* and *Alita Kossa. B*oth of the houses are functionally used for storage; both of them have two floor levels and constructed by local building materials.

The other participant of the focus group discussion was Ato Denote, who is an elder and tourism expert. He discussed about *Reqa,* and *Agita* housing characters and their building location and chronological setup. Both *Reqa* and *Agita* are built on the lower level of the Konso residential compound (*Tikka)*, having two floor levels, using for sleeping and storage functions and thatched roof and wall surfaces including their building forms. As repetedlt pointed out so far, Ato Denote related that *Reqa* is constructed in the entire Konso community residential compound while *Agitas* are built only in the clan leaders of konso inhabitants, and traditional religious leaders (*Mokka*).

Kalla Gezaghn reminded the group that *Agita* is utilized as a waiting place for the corpse of the king.

Denote mentioned the nature of the access doors for *Paffta, Reqa* and *Kossa* housing units, including the size of the doors (*Hara*). Most of the openings are on average 30 cm^2. He also noted that the openings of the two housing charachters (viz, *Paffta* and *Reqa)* in the first floor. Kossa, which is on the first floor, has a gate made from timber. *Agita* and *Manna* have also 60x75cm size of *Harra* with timber wood door leaf, and *Agita* included the door opening on the upper floor storage surface with 50x50cm in size. *Elphign* has a door and two windows. The average size of the window is 100x90cm whereas the door has 65x175cm size.

Picture 5.20 Focus group discussions with Konso elders.

5.4. SUMMARY OF FOCUS GROUP DISCUSSION WITH KONSO VERNACULAR HOUSING EXPERTS

Konso vernacular houses are built by local housing construction experts and local building materials. The experts have their own specialization though they all know one another's work. The roof structure and cover has its own experts; column, beams structural and the other wall constructions also have specialized experts. There are housing experts in all of the nine clan of Konso society. The experts are doing their work in all of the Konso traditional

walled villages. The housing experts do their work by being coordinated by their respected elders and that helps them to keep the value and norms of the Konso society.
Konso vernacular houses have their own symbolic meaning for the Konso people. These types of Konso vernacular houses are constructed together with elders.

The Konso people construct three housing units for their married sons after the first son of the family: *Mana, Reqa* and *Kossa*. Before construction, the family collects the local building material within a minimum of one year in one of their relatives' house. With regard to residential buildings for the married sons after the first son of the family, the newly married son constructs the other housing character other than the three.

The housing expertise construct the vernacular houses based on the symmetrical housing construction system but some of the vernacular houses are constructed differently, especially in the order of the construction of the various segments. Some would begin from the roof and proceed to the wall while others approach it differently.

Construction system of *Manna*

As Ato Lemita Kureba and Ato Denfo Kiffo related, the construction of a Manna housing character starts from the main entrance of the hut called *Harra*, which is built from a timber wood (particularly the vertical left and right side membranes). Its top should be a wooden lintel building element called *Mendurayeda.* Then the central wooden column of the house (*Tudata*) would be in place. The walls would then be constructed and the diagonal roof bracing (known as *Kololta*) would be connected to the wall surface.

The *Tudata* would be fixed with the horizontal wall bracing called *Horrota* by flexible natural tie called *Algeta.* Then the *Kollolta* would be supported by diagonal roof wooden member starting from the central column *(Tudata)* to the mid parts of *Kollolta.* The thatched roof and wall surface *(Kebema)* of Manna was fixed with a vertical and horizontal roof and wall supporting building members by *Algeta*. The thatched roof cover construction is started from the lower roof edge and the proceeds to the top of the roof edge.

Construction system of *Agita*

According to Ato Zenebe Gewaro's presentation, Agita and Manna need a similar construction system and building form but Agita follows a slightly different system because it does not use central wooden column and it has a raised floor surface supported by four wooden columns (with 1.4 meter length).

Construction system of *Reqa*

According to Ato Denote Kusia Shenkere and Ato Denfo Kiffo's explanation, *Reqa's* construction would begin from the four wooden pillars (with an average length of 1.2 meters) suppporting the first floor (*Affda*). Then two wooden beams (*Harenda* or *Kollayada*), which serve to suppport the top floor level, are in place. The *Affda* floor level finishes with wooden floor material called *Litta.* The vertical wooden roof bracing *(Kollolta)* building material would be built in the circular form starting from the raised floor level called *Affda* to the roof edge. All of the *Kolloltas* are bounded by a grass called *Algeta* in order to create the roof edge of the housing unit. The horizontal wooden roof bracing (*Horrota)* and the vertical wooden bracing *(Kollolta)* are tied with *Algeta.* The thatched roof surface *(Kebema)* is built from the lower roof edge of the housing unit to the roof top. After the *Kebema* is built, the *Kekisha* roof surface is tied to the *Kebema* by *Algeta.*

Construction system of *Paffta*

According to Ato Gelebo Kumere, Paffta is the communal housing unit built by the coordination of elders and vernacular housing experts.The construction method of *Paffta* starts from the main circular wooden column is pierce on the prepared central hole on the ground floor level and the six short columns are aslso the next staps fixed on the prepared ground space having an avarage foudation hole 50cm in depth, these six columns having a average length of 1.4mt. height supports the above floor level *(Affda);* the *Affda's* main wooden flooring beams *(Harendas)* are three in number have rounded in shapes and have an average of 30cm. diameter size are lay on the top the six short column *(Tudatta).* The *Affda* floor level is creates by circular wooden small beams having a diameter of 10cm.is called *Harenda*. The wooden floor finish is tightening on the top of *Harenda* is called *Litta.*

The tightening roof supporting beams *(Kollolta)* is fixing starting from *Affda* floor level to the main central column all of the *Kolloltas* are tightening together with the central column of *Paffta* with *Algeta* and the length of main *Tudatta* is deciding to cut its length after all of the *Kolloltas* are fastening together with central column. The construction process of roof structure of *Paffta* is finalized the diagonal *Kolloltas* supporting beams are fixing in two position of the central column and the horizontal roof support *(Horota)* is fixed by flexible natural rope called *Algeta* then the lower thatched roof surface *(Kebema)* tight to the *Kollolta* by *Algeta* and finally the upper thatched roof surface *(Kekisha*) is fixing on the top of *Kebema* then the decorative brick ridge cover *(Mashwada)* is put it on the top of the roof edge by processing of Konso traditional ceremony leading by Konso elders, traditional religious leaders and the *Poqollas.*

Construction system of *Kossa*

Kossa has its own construction system beginning by piercing four columns *(Tudatas)* in to the prepared column hole on the ground, on the top of the *Tudatas* the Affda floor supporting beams (*Haredeas* or *Kalayeda)* are resting properly on the circular wooden column (Tudata). The wooden wall surface *(Kebyada)* has 1.2mt. length and permanently placed on the *Affda* floor space. *Kebyada* is internally finishes with Mud and Cow dung.

The tightening roof supporting beams *(Kollolta)* is fixing starting from on the top edge of *Kebyada.*

Picture 5.21 Focus group discussion with Konso Vernacular housing experts. Show us the four housing experts on the focus group discussion facilitate and interpret by Kalla Gezaghn in his residential compound (Tikka).

5.5. SUMMERY OF KONSO VERNACULAR HOUSES SYMBOLIC MEANING

There are several symbolic meanings that the Konso weave.

Meanings related to *Kekisha*, *Mashawada*, and *Tudata*

Kekisha is one of the Konso vernacular building elements located at the top of the thatched roof. Kekisha is built from grass with an average diagonal length of 1.40 meter and a depth of 60 cm. *Kekisha* is built on selected Konso houses such as *Manna, Paffta, Kossa, Reqa* and *Agita.* This the case because *Kekisha* is used as a signal and sign of houses that are inhabited by fiirst-borns.

Mashawada is a cover for the tip of the thatched roof. It is made from brick. There are two types of Mashawada. The first is shaped like a crown and the second type has a pot like shape. The Mashawada with a pot like shape signifies that the dwellers of the house are ordinary dwellers. The Mashawada with a crown shape signifies that the residents are no ordinary residents; they could be clan leaders or religipus leaders. It is therefore the shape of the Mashawada that is attributed with meaning here.

What about the symbol for the house of a king? The house of a Konso king would add one more item over the Mashawada, i.e. an ostritch egg.

Tudayata is the main central circular wooden column of the Konso vernacular houses. Basically because Tudayata is the major supporting building element and the first local building component in the construction period, it symbolizes the position of a powerful elde that can negotiate and manage conflicts among family members. In this respect, during a confllict between a husband and a wife, the husband will not be able to beat his wife if she happens to hold the Tudayata. (It would be considered as a serious transgression of the Konso elderly authority if the husband hits his wife when she is embracing the Tudayata.) Following this act of the wife, the couple would be able to settle the problem peacefully.

The major and the sub- detail filters are shown as follows:-

- **Original Konso vernacular housing character, function and their meaning.**
  - Location of Konso vernacular houses.
  - Building material.
  - Symbolic meaning.
  - Housing character.
  - Functional usage.
  - Climate

Major Function	Konso vernacular housing character	Remark
Sleeping	Agita, Manna, Paffta, and Reqa	Most of the Konso vernacular houses are classify by three major function like Sleeping, Storage and Communal
Storage	Kossa, Alita Kossa, and Agita	
Service	Manna, Reqa	
Communal	Paffta	

Table 5.1 Major function of original konso vernacular houses; shows us the analysis of Konso vernacular houses classified in three major function of sleeping, Residential and communal.

Housing character	Local building materials							
	Floor finish			Wall finish				Roof finish
	Cow dung	Stone	Wood	Thatched wall	Mud & wood	Wood pine	Masonry wall	Thatched or stone (rammed soil)
Alita. kossa	-	-	yes	-	-	-	-	Thatched
Agita	Yes	-	yes	Yes	-	-	-	Thatched
Eliphign	Yes	-	-	-	yes	-	-	Thatched
Kossa	Yes	Yes	yes	-	yes	yes	-	Thatched
Manna	Yes	Yes	-	Yes	-	-	-	Thatched
Paffta	-	Yes	yes	-	-	-	-	Thatched
Reqa	Yes	Yes	yes	-	-	-	-	Thatched

Table 5.2 Local building material of konso vernacular houses; explain us the analysis's of local building material usage in three finishing building part for the original Konso vernacular houses.

Location of konso vernacular houses							
Housing character	Communal open space	Residential compound of Konso		Several residential compound			Remark
		Oyeta	Arahata	Clan leader	Religious leader	Konso dwellers	
Alita kossa	-	-	Yes	-	-	yes	
Agita	-	-	Yes	Yes	yes	-	
Eliphign	-	Yes	-	-	-	yes	
Kossa	-	Yes	Yes	Yes	yes	yes	
Manna	-	Yes	-	Yes	yes	yes	
Reqa	-	-	Yes	Yes	yes	yes	

Table 5.3 The location of konso vernacular houses; describing us the analysis of the location of Konso vernacular houses.

5.6. REASON FOR TRANSFORMATION OF KONSO VERNACULAR HOUSES.

Using the focus group data collection tools presetting by Konso elders and Konso vernacular building experts, there are some reasons found to be pushing factors for transformation of Konso vernacular houses.

Population growth and land scarcity

Both population growth and land scarcity are interrelated with each other. The population growth is, basically, intentional in konso society. Each family is supposed to have four children and more. The community takes getting more children as a culture. The population growth caused land scarcity and most of the farm lands are changed to residential compound forcing the vernacular housing characteristics to make some kind of transformation.

As to Ato Dinote Kucia, from Dutrate Kebele, previously, konso was not densely populated. It had several hillside farming lands and standardized residential compounds. Kucia said that the konso villages are formed in fortified village formation. Most of the earliest konso villages have more than three stone walls (Paletas).These compacted village formation and lack of health care knowledge exposed a lot of kids to death. Because of these and other reasons, the konso societies developed culture of giving birth to a lot of kids in one family. That contributed to the population growth. Additionally, Kucia thought that shortage of the farming land is also one of the Konso people' big problems and cause of waging war between the Konso people and other nationalities like Birgi and Gugi. The population density caused not only land

Urbanization

As to Kalla Gezahan's description, one of the reasons for transformation is urbanization. Because of urbanization especially in Dekato, Duryte and some parts of Gamole stone walled villages (Palettas) are constructed near Woreda town, karat. The dwellers built several types of transformed houses in the zonal city.

Daily laborers and modern house construction experts, as to Ato Denfo, dwell mostly in market places and that exposes them to modernity which caused competition among the neighborhoods in building corrugated iron sheet housing character. Because of these, some young people began going to Adolla to dig out gold and build house with corrugated iron sheet roof for their family.

Shortage of local building materials

Grass, Stone, Wood and Algeta (flexible natural rope) are the most essential building materials for construction of konso vernacular houses. Most of the konso hills are changed to farming lands due to different reasons among which population growth is one. These caused lack of selected grass type use for thatched roofing and forced them to use several

types of woods for roof beams, roof bracing and columns. So, the land scarcity caused lack of local building materials. When the lands are changed to stone walled houses (Palettas), it caused lack of local building materials; especially the wood & grass became very expensive as there was no land to grow them on. And, that arose need to look for other opportunity to build houses in less price.

Ato Otoma Kuddado from Gamole described the causes of transformation. As to him, local building materials are very expensive except stone. New houses are being built and older ones are being maintained their house. For new houses, all kinds of local bulling materials are needed. On the other hand, most of the Konso vernacular houses are very old which needs maintenance. The Grass is very important for maintenance purpose as the old houses have problem mostly in their thatched roof and thatched wall surfaces. This is among the reasons that raise the price of grass as to Ato Gelabo. Grass is basically needed but it is not sufficient due to scarcity of grass land. For this reason, the building materials became very expensive than the corrugated iron sheet and hollow block wall.

Ato Gelebo Kessis, describing the causes to transform Konso vernacular houses, raised lodge construction as one in several Konso special Woredas.The lodges are built with local building materials like masonry wall fastened with cement mortar, mixed mud with straw and sticking it to wooden wall surface. And, build the roof surface with thatched (Grass) in high thickness. These types of lodge construction projects collect the local building materials from the farmers with attractive price. Almost all of the Konso people sell their own wood and grass to these projected. Then, the Konso people face great shortage of grass and wood. If they are available on market both materials are very expensive. So they are forced to use modern building materials and transform their houses.

Termite attack

Describing the reason for transformation of konso vernacular houses like Manna to Elfennotta (Elphign) and other housing characteristics, Ato Glebo said specially Mana is constructed by building the thatched wall surface from ground up to the end of the roof. Because of this construction system, the wall surface is exposed to termite attack. So, that enhanced the need for transformation. As to him, Elfennotta (Elphign) is transformed from manna housing character with circular compound; its wall is constructed using mud & wood with 1.5 m. height at an average. The circular mud & wood wall surface is from ground with special Architecture space to be used for husband, lighting fire, maternity home and resting space kids. Presenting information on how Elfennotta (Elphign) is constructed, Ato Glebo he

said that it is constructed on the elevated ground surface of Konso residential compound (Tikka) Called Oyeta.

Ato Robo, talking about the reason for transformation of Manna to Elfennotta (Elphign) and Paffta housing characteristics, mentioned the termites' attack as one reason. They attack the thatched wall surface of Manna and the long sloppy thatched roof surface of *Paffta*. Basically the pre transformed Manna wall is constructed with grass. The thatched wall surface of Manna is built starting from ground level to end of the roof edge. On the other hand, the thatched roof surface of the original *Paffta* is constructed with grass starting from roof edge to ground surface. Because of their building form the Manna and *Paffta* are exposed to termites attack. For this reason, the Manna is transformed to *Elphigh* and the *Paffta*. That means, the long sloppy thatched roof is reduced in its length to an average of raised floor level 1.45 meters long.

Italian Invasion

As to Ato Gelabo, the nature of the original *Paffta* housing form is that it has only one gate *(Harra).* The unmarried young Konso people spend their night in *Paffta* to serve the society by keeping their wall village from attack of external forces, wild animals and fire. As to him, during the Italian invasion, the Italians attacked *Pafftas* and took all the young Konso people for their hard work. All most all of the *Pafftas* were closed all round surface with its thatched roof surface that would lie on the ground having only one small open gate (Harra). After the invasion, these types of *Pafftas*' forms were transformed by reducing their thatched roof slopes length and gates became raised floor surface. And, the transformed *Pafftas* became open in all round circular space by raising the sloppy thatched roof in a way they could see anyone at a distance.

The major and the sub- detail filters are shown as follows:-

- **Reason for transformation of Konso vernacular houses.**
  - Land scarcity and Population growth.
  - Urbanization.
  - Shortage of local building materials.
  - Termite attack.
  - Italian Invasion.
  - Lodge construction

Influencing reasons	Konso vernacular housing character	Remark
Population growth and Land scarcity	Manna, Kossa and Alita Kossa	
Urbanization	Paffta, Manna and Kossa	
Shortage of local building material	Manna and Kossa	
Termite attack	Paffta and Manna	
Italian invasion	Paffta	

Table 5.4 The influencing reasons for the transformation of konso vernacular houses. Presenting the analysis of the Konso vernacular houses transformed by several influencing reasons.

5.7. OBSERVATION

I was observed, in some of walled villages *(Palletas*) near Karat (the Konso zonal town), the totally transformed Konso vernacular houses. Especially, children of Durayite and Gamole dwellers, learn in Karat elementary and secondary school. The market place is also occupied by several fabricated building materials with attractive buying price. So, they are much influenced by urbanization a cause of the transformation. The Qorkoro housing experts or carpenters build the totally transformed Qorkoro houses without difficulty in karat. They construct it in town with not more than four carpenter helpers within five days. They use an average not more than 36 pieces of corrugated iron sheet roof cover in the form of rectangular shape.

Moreover, in my research time I observed Dekato walled villages have high population density. Dekato is the first walled village in Konso settlement. Dekato has six protection dry stone wall around the village. The first dwellers of Dekato settled inside of the first dry stone protection wall. Because of the formation of Dekato, the population is dense in the six walled villages. This type of living condition created the land scarcity in both ways: the farming land and the residential compound.

The new generation of Dekato find job in Karat and Adolla- a place where gold is mined. This generation is finding Gold in traditional way from Adolla gold mining. After making some money, they back to Konso and build the totally transformed Qorkoro houses in their walled villages. This type of experience went on to the other fortified villages. The other thing I was observed other two walled villages *(Palletas)* Facia and Gaho which are 23 kms far from the

zonal city of Konso. In these villages, I, the researcher, saw the total transformed Qorkoro houses are very small in number. This type of transformation took place because of shortage and expensiveness of local building materials.

5.8. THE TRANSFORMATION PROCESS OF KONSO VERNACULAR HOUSES.

Partial / Hybrid transformation

By means of the focus group data collection tools presetting by Konso elders and Konso vernacular housing experts, there are some transformation process of Konso vernacular houses.

Describing about how the konso society transform their houses, Kalla Gezagn said the transformations are done on form (physical transformation), space (spatial transformation). Kalla Gezagnd said some of the konso vernacular houses are transformed in form and spaces but still the transformation respects the norms of the society - for example, as to him, he himself partially transformed the *Manna* hosing unit to *Elphgn*. His reason was that the *Manna* house roof and wall is constructed by grass. The grass then became very expensive. Because of this, the thatched walled surface of *Manna* was constructed by mix mud and straw fixed to wooden wall surface to save or minimizing the grass quantity. The transformed house wall having minimum height of 1.4 m. This type of transformation is in terms of form and internal special architectural space.

The other type of partially transformed house is *Paffta. Paffta* is a community house constructed in an open space called *Morra*. This type of house is originally constructed with its roof not high up from the ground level, thatched cover to the ground. It is only 40- 50 cm in spot place at the door but the other part of the roof touch the ground. The partially Transformed *Paffta* has reduced roof structure of its roof slop length and having space between roof edge and ground level 1.35m. At an average. It is built with thatched roof, column and beams and raised floor surface. The transformation mainly focuses on the form of the *Paffta* vernacular house and this type of transformation is accepted by the society.

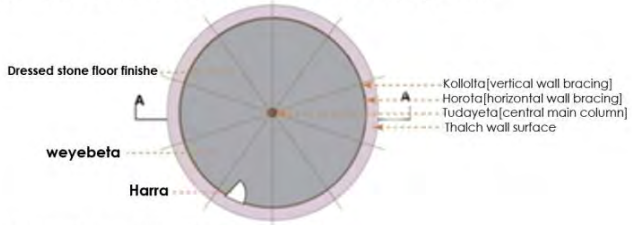
According to Ato Otoma, one type of hybrid transformed housing character is *Paffta*. The original *Paffta* is built at the ground open shaded surface with un-mortared masonry wall and its floor surface is finished with flat smooth stone type. But, ground surface of the hybrid transformed *Paffta* is constructed with stone masonry wall bond with cement mortar and plastered with sand and cement it has also masonry wall finished with cement screed. The floor surface created a depressed space by 50 cm in length and the floor surface is built with

mass concrete flooring and finishing with cement screed. The roof part of *Paffta* was built as respected the Konso people culture. This type of *Paffta* is called Ceminto Morra *(Paffta)* located in Durayete walled village.

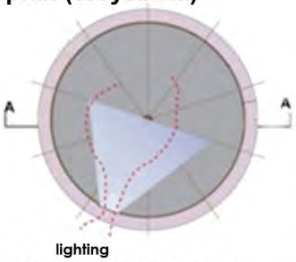
PARTIAL TRANSFORMATION OF *MANNA* TO *ELPHIGN*

BEFORE

Untransformed original Manna housing unit



Ground floor plan (Weyebeta)



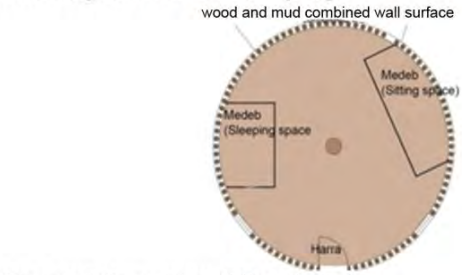
Lighting and Pathway in Weyebeta

Sectional view of Manna

Elevation of Manna

AFTER

Partially transformed Elphigh



Ground floor plan (Weyebeta)

Section of Elphigh

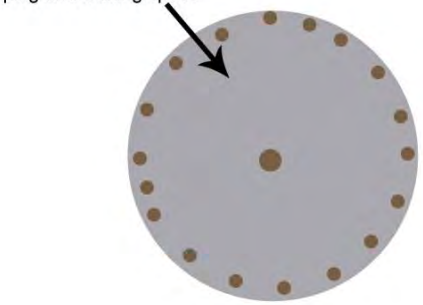
Elevation of Elphigh

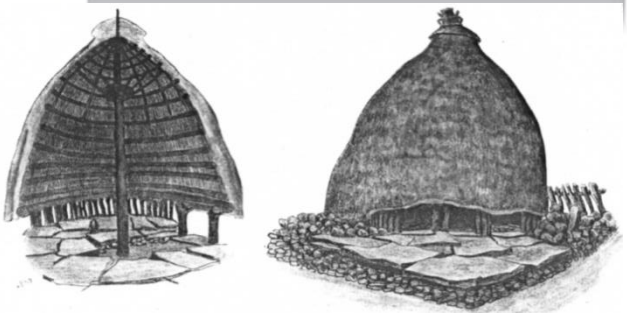
Figure 5.16 the graphical and sketch analysis of untransformed original *Manna* and partially transformed *Elfennotta (Elphign).* show us the of untransformed *Manna* and Partialy transformed *Elfennotta (Elphign*) and sketch map of *Elfennotta (Elphign*) with its ground floor plan (Weyebeta), section and elevation.

PARTIAL TRANSFORMATION OF *PAFFTA*

BEFORE

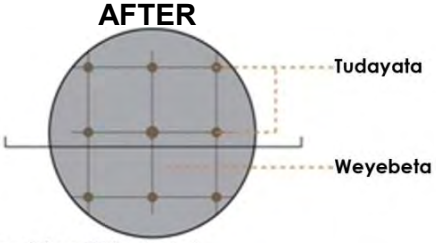
The resent untransformed older *Paffta*



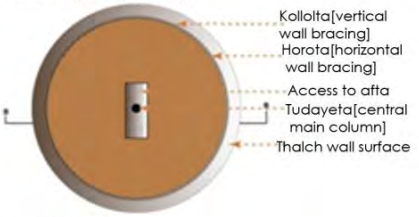


Sket map of *Paffta* by Gebremedehen in 1971

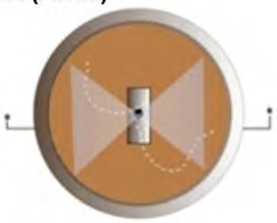
AFTER



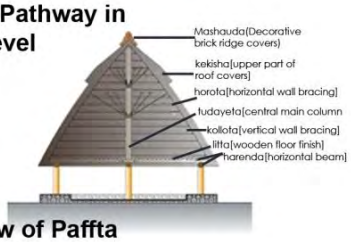
Ground Floor Plan (Weybeta)



First Floor Plan (Affda)



Lighting and Pathway in Affda floor level



Sectional view of Paffta

Elevation of Paffta

Figure 5.17 Graphical and pictorial analysis of untransformed Paffta and partially transformed Paffta. shows the untransformed old *Paffta* seen before 43 years but using the present partially transformed *Paffta* sectional maps are shown the existing *Paffta* communal housing unit.

BEFORER **AFTER**

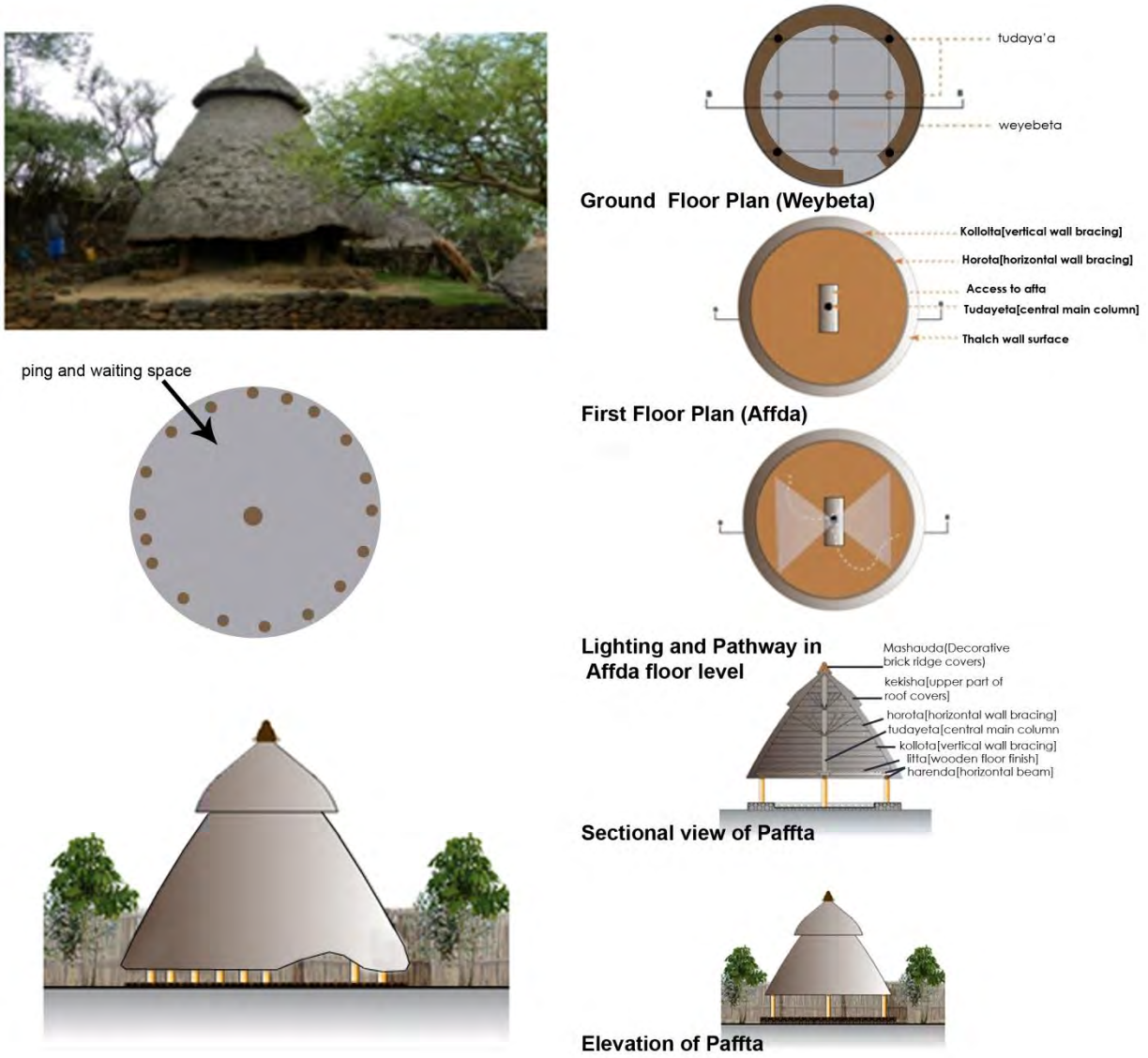


Figure 5.18 Pictorial and sketch analysis of older untransformed *Paffta* and the hybrid transformed sketch maps of *Paffta.* shows us the pictorial and sketch maps of untransformed older *Paffta* and the resent hybrid transformed communal housing unit *(Paffta)* built with masonry wall foundation, plasters and cement screed wall finishes and constructed with local building materials.

Total Transformation

Some of the konso vernacular houses are totally transformed; with building material and form of the vernacular houses. These types of houses, as Kalla Gezagn describes, are constructed with corrugated iron sheet roof cover of the house using wood & mud as building material for the wall. And, the circular Konso vernacular housing characteristics are changed to rectangular in form. This type of total transformation is not accepted by Konso people. But, because of urbanization & increase in the expense of building materials, the transformation is still going on. Ato Otoma supported this idea and added the transformed Qorkoro Morra was not constructed by Konso traditional housing experts and by the support of the Konso elders. They were built by young Konso people in the Derg regime and the young Konso people did so only in Durayite. This type of transformation done on *Paffta* never keeps the value and culture of the Konso.

Ato Denote, one of the focuses group discussion participants, said the Konso vernacular houses arc transformed in different ways among which total change is one mentioning his house as an example. He got his houses from his family according to the Konso culture; he is the elder Son of his family because of this he got the houses together with the residential compound directly. As to his explanation, the houses were very old and he tried to maintain them. Ato Denote, after trying to maintain his houses a minimum of two times, specially the *Manna* and *Kossa* houses, demolished both of them and used their local building material wood for the wall of his new house and is constructed the transformed houses with corrugated iron sheet roof cover, having two floor level in rectangular form. He built the wall with combined local building materials: wood and mud. And, its ground surface was built by timber.

The semi basement floor functions as a storage place for grain and farming materials. The ground floor functions as a sleeping room for wife and husband and one bed room for young children. It also has small living / waiting space. According to him, the newly transformed house is built in the lower level of his compound *(Arahata).* The living space, however, is not functional as he intended it because of the hot climate. Denote built his transformed house by demolishing the old *Manna* and *Kossa* houses in his compound. He uses the raised floor surface functionally for maternity, sleeping and living house. The same basement floor serves as *Kossa* for storage purpose of grain and farming equipments.

Ato Gelabo, on his part, said *Paffta* is widely transformed housing character. It was reconstructed in all of the research areas of Konso in the fortified villages as to him. The totally changed *Paffta* make the transformation with building material, form and space.

These types of *Paffta* were constructed in the Early 1978 at the time of Derg (Military government). The previous *Paffta* which is older in age needed total maintenance. At that time, no one listened to the elders' suggestions and respected the traditional culture of Konso. The old *Paffta* house was demolished and built with corrugated iron sheet roof cover. The new *Paffta* became rectangular in shape, full closed wall constructed by wood over covered by mixed mud and straw and having wooden door and windows. This *Paffta* is called by Konso people as Qorqoro Morra. It is totally transformed and its function also changed. Gelebo said Qorqoro Morra was supposed to be used as a storage space of some equipment for community. Because of its corrugated iron sheet roof cover and full closed wall, its internal temperature became very high. No unmarried young Konso people spend the night in the new *Paffta.*

As to Ato Otoma The totally transformed *Paffta* located only in Durayite wall village is changed in form, space, and building material: rectangular in shape, corrugated iron sheet roof cover and that could not give the previous function. Even, its name is changed from *Paffat* to Qorqoro *Morra*. Basically, as to his explanation, *Paffta i*s the name of the communal house in Konso. The totally transformed *Paffta* is changed to Qorqoro *Morra*. So, it got its name from the communal open space called *Morra.* Ato Otoma stressed that the transformation together with the name change from *Paffta* to *Morra* is not acceptable. He also added that some other Konso vernaculars houses are transformed with corrugated iron sheet roof cover. These types of transformation do not keep the culture of the Konso people as to his explanation.

Presenting how Konso community transforms their houses, Ato Robo mentioned two ways. The first one is the total transformation of houses like Qorqoro (it got its name get from its roof surface which is constructed with corrugated iron sheet root cover) and partially transformed houses built with local building materials and the modern one like hollow concrete block work, concert and cement.

In the case of Qorqoro housing character, it is built with local and modern building materials within short time having a rectangular shape in form. And, concerning its function, it is not used especially in hot seasons. In hot seasons, the Qorqoro houses are very hot and cold in the rainy seasons, they say the houses are lying; if the rain falls at night time, the corrugated iron sheet roof cover creates heavy noise and in the morning don't get that much water. These types of houses do not respect the Konso people values and norms.

The Qorqoro houses are built in different homestead places majorly they are located in *Arhata* lower surface of the residential compound *(Tikka)*. The Konso people build with two types of materials like cement and concrete combined with local building materials. This type of transformation is mostly located in Durayite.

TOTAL TRANSFORMATION OF *KOSSA* TO QORQORO HOUSINH UNIT

BEFORE **AFTER**

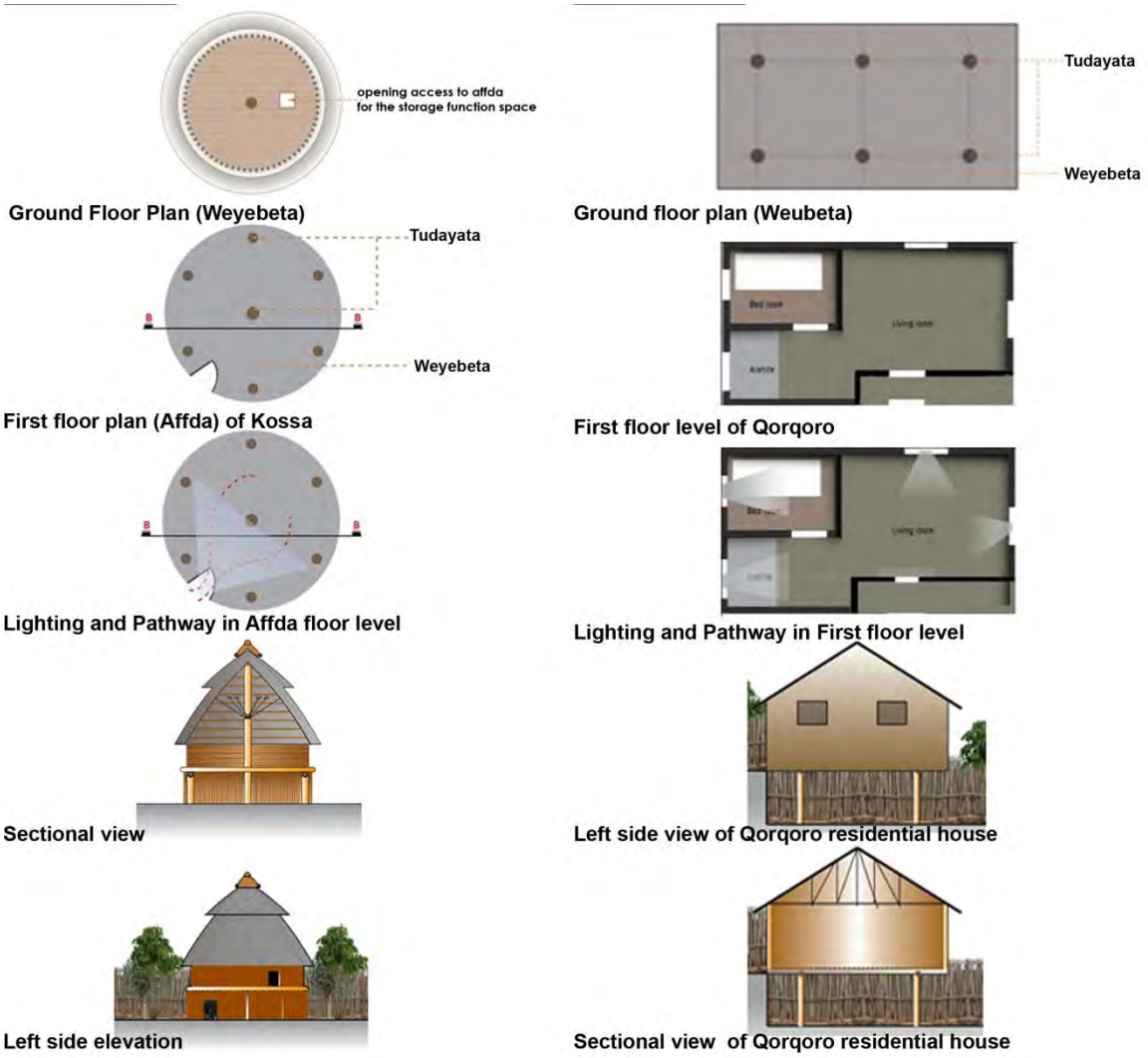
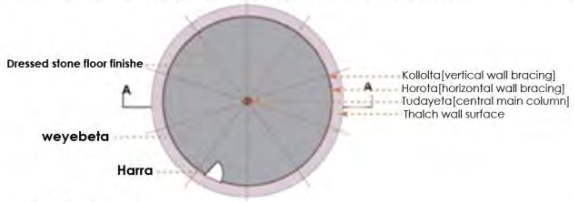


Figure 5.19 The graphical and sketch maps of untransformed *Kossa* and the totally transformed Qorqoro residential house. shows the sketch and graphical analysis of untransformed older *Kossa* and the totally transformed Qorqoro residential house.

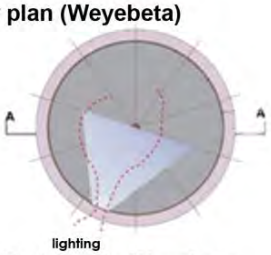
TOTAL TRANSFORMATION OF *MANNATO* QORQORO HOUSING UNIT

BEFORE

Untransformed original Manna housing unit



Ground floor plan (Weyebeta)



Lighting and Pathway in Weyebeta

Sectional view of Manna

Elevation of Manna

AFTER

Ground floor plan (Weubeta)

First floor level of Qorqoro

Lighting and Pathway in First floor level

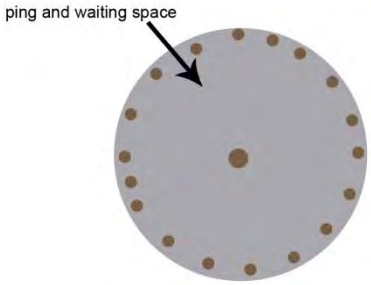
Left side view of Qorqoro residential house

Sectional view of Qorqoro residential house

Figure 5.20 Show us the sketch map of untransformed *Manna* and the totally transformed Qorqoro residential house.Shows the sketch maps and analysis of untransformed older *Manna* and the totally transformed Qorqoro residential house.

TOTAL TRANSFORMATION OF *PAFFTA*

BEFORE

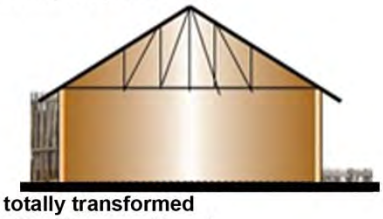


AFTER

Front view of totally trans-formed Qorqoro Paffta (Qorqoro Morra)

Partial views of totally transformed Qorqoro Paffta (Qorqoro Morra)

ground floor of totally transformed Qorqoro Paffta (Qorqoro Morra)



section of totally transformed Qorqoro Paffta (Qorqoro Morra)

Elevation of totally transformed Qorqoro Paffta (Qorqoro Morra)

Untransformed *Paffta*

Front view of totally transformed Qorqoro Paffta (Qorqoro Morra)

Figure 5.21 describe the pictorial and sketch maps of untransformed *Paffta*, and totally transformed Qorqoro *Paffta.* Shows us the analysis of the untransformed older *Paffta* and several views of totally transformed Qorqoro Paffta (Qoroqro *Morra).*

The major and the sub- detail filters are shown as follows:-

- **The transformation process of Konso vernacular houses.**

  Partial / Hybrid Transformation.

  Total Transformation.

  Normative Transformation

Function	Manna	Elfennotta (Elphign)	Remark
Maternity	Yes	No	At the delivery time the mother will go to her nearest Manna house.
Cheka (Local beer) preparation	Yes	No	Chack preparation was done under Reqa
Children sleeping	Yes	Yes	
Husband & wife sleeping	Yes	Yes	
Resting place of head of the house and his friend's	Yes	No	Resting place was changed to under the shade of Reqa

Table 5.5 the partially transformed of konso vernacular houses. Show the Analysis of Partially transformed *Manna* to *Elfennotta* (*Elphign*) Based on function

Building components	Building materials					Remark
	Grass (Thatched)	Wood pine	Stone	Cement and sand plastering	Cement screed	
Roof surface	Yes	-	-	-	-	
Columns	-	Yes	-	-	-	
Roofing beams	-	Yes	-	-	-	
Massonary wall	-	-	Yes	yes	yes	
Floor finish	-	-	-	-	yes	

Table 5.6 the hybrid transformed of Paffta vernacular houses. shows us the Analysis of hybrid transformed *Paffta* based on building material implemented on masonary and floor surfaces.

Building components	Building materials						Rectangular form	Remark
	CIS	Circular wood	Wood pine	Dersed Stone finish	Mud finish	Timber finish		
Roof surface	yes	-	-	-	-	-	yes	
Columns	-	Yes	-	-	-	-	-	
Roofing beams	-	Yes	-	-	-	-	-	
Wall surface	-	-	yes	-	Yes	-	yes	
Floor surface	-		-	Yes	-	yes	yes	
Door	yes	-	-	-	-	yes	yes	
Window	yes	-	-	-	-	yes	yes	

Table 5.7 The totally transformed of *Paffta* Konso vernacular houses. Shows the Analysis of totally transformed Paffte to Qorqoro Paffta (Qorqoro mora) based building material implemented on several parts of the building unit and its building forms.

Building components	Building materials						Rectangular form	Remark
	CIS	Circular wood	Wood pine	Dersed Stone finish	Mud finish	Timber finish		
Roof surface	yes	-	-	-	-	-	Yes	
Columns	-	Yes	-	-	-	-	-	
Roofing beams	-	Yes	-	-	-	-	-	
Wall surface	-	Yes	yes	-	Yes	-	yes	
Floor surface	-		-	Yes	-	yes	yes	
Door	yes	-	-	-	-	yes	yes	
Window	yes	-	-	-	-	yes	yes	
Roof surface	yes	-	-	-	-	-	yes	

Table 5.8 the totally transformed of Manna and Kossa Konso vernacular houses.Shows the Analysis of totally transformed *Manna* and *kossa* to Qorqoro residential housing unit on building material and building form implemented on several parts of the building elements.

Normative Transformation

Ato Denote Kusia presented about the symbolic meaning of the houses like *Kekishna* and *Mashawalda. Kekisha* is the upper roof part of the Konso vernacular houses stepped up on a lower roof surface with 50cm thickness at an average. It has a slopping length of 1.4m. *Kekisha* is usually found on konso vernacular houses like Manna, Kossa, *Reka* as a sign where all of the first sons of the Konso society reside. It is also located in all Konso clan leader residential compounds *(Tujja)* and *Paffta*- the community house located in an open communal space called *Morra*. Therefore, *Kakisha* has two special meanings for the community- the sign of a house of first sons and clan leaders. *Kekesh*a is used as food for cattle for Konso society in the case of lasting dry seasons. In the dry seasons, it is not easy to get grass. Due to this, the society uses *kakisha* thatched roof as food for their cattle. Because of this, almost all of the konso community built his house with *kekisha* thatched roof; which is originally built as a sign only for elder sons and clan leaders. So, at present time, it becomes difficult to understand which ones are residential of elder sons or the clan leaders. This type of normative transformation is accepted by the society. Ato Robo, talking about the symbolic meanings of Konso vernacular houses, took *Mashawada* and *Kelasha* as example. He said *Mashawada* is made from burned break in a form of a pot and crowned at the top edge of a communal house called *Paffta.* And, it is put on every Konso vernacular houses located in the *Poqula's* (clan leader) homestead.

Mashawada in Konso society has big meaning and place. At the top of the *Mashawada* is put an ostrich egg which signifies the compound is owned by *Poqula* and traditional king of Konso *(Tikka).* If there is *Mashawada* at the top of *Paffta*, it means the house symbolizes it is respected communal house which serves the community. *Paffta* with its *Mashawada* is built by the whole community being leading by the elders and the Konso housing expertise.
Most of the Konso vernacular houses have *Mashawada* but these *Mashawada* is made from old pot that do not have crown slope. Some of Konso homesteads have *Mashawada* made with old iron bowls. Ato Robo, describing the symbolic meanings are being, said transformed symbolic have created their own norm and a different meanings. Explaining the traditional norm related to *Mashawada*, he raised the following:

If there is Konso vernacular house, it means there is a person; if there is *Mashawada* on traditional house, there is fire in the house and if there is fire that means there is food.

Housing character	Type of the transformation				Remark
	Partially transformed	Totally transformed	Hybrid transformed	Normatively transformed	
Elphign	Accepted	-	-	Partially Accepted	
Qorqoro Paffta	-	Totally rejected	-	Totally Rejected	Used as storage functionally
Qorqoro residence house	-	Accepted by some young Konso people	-	Totally rejected	Acceptance is based on its several function
Ceminto Paffta /Ceminto Morra /	Partially Accepted (By young Konso people)		Partially Accepted (By young Konso people)	Rejected by Elders	

Table 5.9 Analysis of the level of acceptance of the normatively transformed Konso vernacular housing units. Describe the Analysis of the level of acceptance the normatively transformed konso vernacular housing units.

5.9. OBSERVATION

I was observed the transformed Konso vernacular houses in Durite, Dekato and Gamole wall vellages inthree ways. The partially transformed Konso vernacular housing unites are located in cas one wall villages specially in Dekato and Duriyete I got a lot of Manna housing unites transformed to Elphign cousing characters parially. The transformation was seen on form (physical transformation) and space (spatial transformation).

Some of the konso vernacular houses are totally transformed; with building material and form of the vernacular houses. Most of the totally transfored Konso vernacular houses are residential in function located in Dekato, Durayete and Gamole walled villages and the totally transformed Qorqoro Morra (Qoroqoro Paffta) is located only in Durayetein but this type of total transformed Paffta was not constructed by Konso traditional housing experts and by the support of the Konso elders and built by young Konso people in the Derg regime and not accepted by Konso people.

I was observed in konso vernacular house thatched roof constracted steeped up on a lower surface of thatchrd roof in Manna, Kossa, Reqa and paffta housing unites thes upper roof part is calle Kekisha. On the top of Kekisha the burned break in a form of a pot and crowned is called Mahawada these type of housing elementes are it has its owen symbolic meaning for konso socity. These housing elements are built missed placed having a resalt of normative transformatio.

5.10. CONSQUANCE OF THE TRANSFORMATION

Explaining about the future impacts of transformation on the community, the konso elders, housing expertise and Kalla Gezagn interpreted it in terms of cultural value, social needs, and economy. And, they are presented categorized in to negative and positive consequence.

Negative consquance

Lack of cultural value

Ato Denote Kusia, from Durayte and a tourism expert, has deep knowledge of Konso society. He said the transformed houses are several types some of which are *Paffta* and *Manna.* The totally transformed houses don't respect cultural values and social needs. The corrugated iron sheet roof covered houses, for instance, don't show the cultural value of the Konso people because they miss originality of the Konso vernacular houses.

Kalla Gezaghn said the transformed Qorqoro *Mora (Paffta)* does not have *Mashawada* and *Kekisha* on their roof top like that of the Konso vernacular houses. So, they luck capacity to convey the symbolic meaning that *Mashawada* has. He resumed explaining that the *Tikka* (residential compound) misses *Kekisha* and an ostrich egg on its top which signifies the house is the house of clean or traditional king of Konso.

Ato Otoma also remarked some Konso people use *Mashawada* on their newly transformed houses as an esthetic value and that blurred the meaning the society has for *Mashawada*. Some of Konso vernacular houses have their own symbolic meanings for Konso people. However, these meanings are being changed as to him.

Social Needs

Regarding the social need, some of konso vernacular houses fulfill social needs of the society. But, the transformed houses are constructed without fulfilling these needs and the Konso people don't like them. As to Ato Robo's explanation, the totally transformed Konso

vernacular houses particularly *Paffta* which is found in Durayite village has not respected the tradition of the Konso elders. The elders could not pass verdict in *Paffta* and the young Konso people could not stay night in it for their common post. This was because it was formed in closed wall surface and corrugated iron sheet roof cover which released much heat during dry and hot climate. The *Qorqoro Paffta* also did not have a sitting place for elders from which they are supposed to watch their walled village.

Economic Sost

In terms of economy, the totally transformed houses with its building material, form and space are economical to construct; cheaper than the konso vernacular houses but do not tend to last long. They always need maintenance. And, that is expensive to handle the maintenance as they do not have expertise knowledge.

According to Ato Otoma Kudada, the house, especially the roof cover of totally transformed house needed maintenance within 5-7 years. The maintenance cost has become higher even for the houses that have been transformed in recent days. He added that Qorqoro houses have not fulfilled the culture, values and social needs of the Konso people. Ato Gellebo Kemnere, the Konso housing expert said, on his part explained that the Konso housing experts and their supporters lost their job of building vernacular houses as the transformed ones are built in a short time interval.

Positive Consquance

The transformed Konso vernacular houses do have positive and negative impacts on the community as to the data gathered from the target group. Ato Denote transformed his vernacular houses being influenced by building types at his work place and in the zonal city, Karat. Concerning its positive impact, he said it was very cheap to build new house than maintaining the old ones when he built his house Qorqoro 35 years before and they take it as a sign of development. Ato Otoma Kudada, the housing expert of Konso vernacular houses, said the community accepted and adapted the partially transformed houses which are built by cement and sand mortar. He added that they build several *Pafftas* by the cost of maintaining the old Konso vernacular houses.

Consequences	Transformation type	Transformed Konso vernacular housing units	Remark
Negative impacts			
Luck of cultural value	Total transformation	Qorqoro Paffta, Qorqoro residential house	Because of luck of Kekisha and Mashawada
Social need	Hybrid transformation	Ceminto Paffta	Reduce the social need by Konso elders
Economic cost	Total transformation	Qorqoro residential houses	Expensive in maintenance cost and labor cost of the experts

Table 5.10 Analysis of the negative consequence of the transformed Konso vernacular houses. Shows us the analysis of the negative consequence of the transformed konso vernacular houses.

Consequence	Transformation type	Transformed Konso vernacular housing unites	Remark
Positive consequence			
	Partial transformation	Paffta and Manna	Recognize the social need and cultural value
	Hybrid transformation	Ceminto Paffta	Accepted by young Durayete community
	Total transformation	Qorqoro residential house	Some number of Konso people gave recognition because of less amount of cost for building the new transformed Qorqoro house.

Table 5.11 Analysis of the Positive consequence of the transformed Konso vernacular houses. Shows us the analysis of the positive consequence of the transformed konso vernacular houses.

5.11. OBSERVATION

I am observed how Konso community transforms their houses in several walled villages *(Palletas)*. The transformed Konso vernacular houses are located in most of fortified villages. Most of the transformed Konso vernacular houses are built in Dekato, Durayite and Gamole. These walled villages are located around Karat city. I have noticed the transformation is classified in to three ways. The first type of transformation located in all of the research walled villages is totally transformed in building material, form and space. The physically transformed Konso vernacular houses are built with modern building materials and the circular thatched roofs are changed in form to rectangular housing character. The second type of transformation was hybrid / partial transformation. In some of the walled villages of the study areas were constructed with modern and local building material together. I observed in the study areas this type of transformation was accepted by the Konso people. This transformation was done by mixing local building material with the modern ones but keeps the Konso cultural value and norms. The third one was normative transformation where meanings the society assign to parts of the houses changed. Mostly this type of transformation is locating at building elements and forms of roof part.

CASE TWO

Under this case study, twenty three km. distant walled villages from the zonal city of Konso namely Gaho and Fasha are treated.

5.12. ORIGINAL KONSO VERNACULAR HOUSING CHARACTER, FUNCTION AND THEIR MEANING.

The original Konso vernacular houses have the same functional housing character as to case one but in these study there are two additional stone Konso vernacular housing characters are located; these Konso vernacular stone houses are called *Kimilitas. Kimbilita* Konso vernacular housing characters are also divided in to two housing unites the first one is *Koimbilita Paffta* and in the second housing unites is *Kimbilita Kossa*. All *Kimbilitas* are built with local building material like stone and wood. The stones are used as wall construction building surfaces and the wood is used to for supporting columns and roof beams. In these study areas the vernacular houses are functionally divided into three major branch those which serve as a storage housing character like *Kossa, Alita kossa, Kimbilita Kossa, Reqa,* and *Agita* the second housing characteristics serve as living cottages like *Manna* and *Elfennotta (Elphign)* and the third one was social service housing character called *Kimbilita Paffta* and *Paffta(Magana)*. These both *Pafftas* are located only in open communal spaces known as *Morra.*

As to the konso elders, Ato Gelebo Beyene from Gaho add most of the walled villages *(Palletas)* are located at mountainous areas because of several reasons like the hills have good to avoid external enemies, In the second place, the Konso people secured from overflow of water in the rainy season and protect themselves from sicknesses of yellow-fever caused by mosquitoes by building their house at the mountainous areas.

Ato Lemita kureba from Fasha discusses the chronological order of Konso vernacular houses located in homestead; there is an arrangement the Konso vernacular houses are built in Fasha and Gaho; the residential compound *(Tikka)* is divided in two parts; the lower part planned for keeping cattle and indoor or outdoor service or both working facilities is called *Arhata* and the upper part used for residential compound is called *Oyeta.*

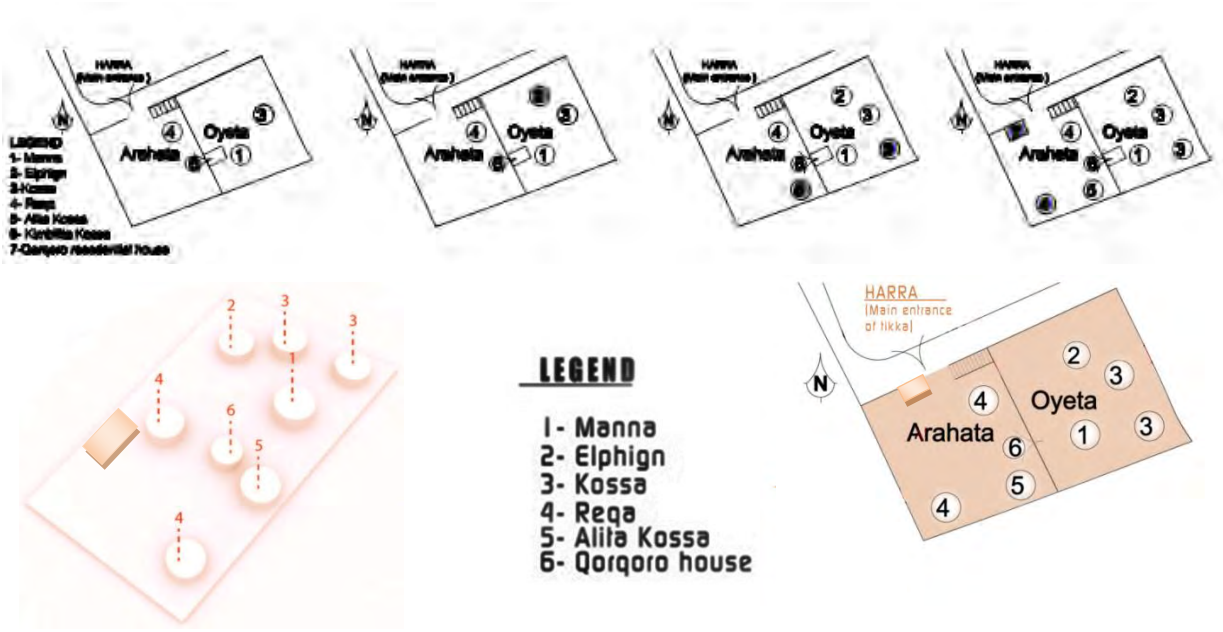
As to him most of the totally transformed houses have rectangular in shapes and the roof surfaces are constructed with corrugated iron sheet roof material and all of them are built in *Arhata* residential compound space called *Tikka.* The *Manna, Elfennotta (Elphign)* and *Kossa* residential and storage homes are built at the upper level of the homestead and the *Reqa, Kossa, Alita Kossoa,* and *Kimbilita Kossa* are located at the lower level to the compound called *Arahata*.

Picture 5.22 Ato Gelebo Bayeto the interviewee from Gaho walled village

Life story

Ato Gelebo Bayeto is an interviewee from in Gaho village. He got married 22 years ago and has two boys and one young girl. His first son is ready to marry. He is a strong farmer and housing expert in construction of stone houses in Gaho walled village. He has deep understanding of Konso vernacular houses located in Fasha and Gaho walled villages. He talked about the two stone housing units of Konso vernacular houses located in both walled village. He presenting in depth the stone housing unit located in every *Tikkas* of Fasha and Gaho walled village called *Kimbilita Kossa* and the totally transformed Qorqoro house built by his son in his residential compound; the Qorqorq house is using for storage purpose of farm equipments, dray grass for domestic cattle food and for fire wood making by small amount of construction expenses.

Ato Gelebo Beyene is the third born boy for his family he has an elder sister was marred and the marred elder brother is living with his father and mother together and he must help his parent in the older edge as Konso's culture. Gelebo is 48 years old and respecting strong farmer and his farming land was located around his walled village he got the residential compound and farming land according to Konso land authentication system; the system is facilitates by traditional structured group organized with *Porshetta, Emyebeleta* and *Hella* in his Kanta. Ato Gelebo's parents are built the Konso vernacular houses like the other Konso society *Manna, Kossa,* and *Kimbilita Kossa (Roqa). Kimbilita Kossa (Roqa)* built according to the residential compound landscape character. Gelebo add several housing characters in his *Tikka* according to his family increasing in number within several times interval. He built a number of Konso vernacular houses like *Elphign, Kossa, alita Kossa, Reqa* and the totally transformed Qorqoro house. The hidden stone house constructed under *Manna*, *Elphign* and *Koss* called *kimbilita kossa (Roqa).*



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Sketch 5.8 sketch analysis of Konso vernacular houses located in residential compound (*Tikka*) of Ato Gelebo Beyeto and it expresses us the Konso vernacular houses construction time intervals in Ato Gelebo Beyeto's residential compound (*Tikka*).

Harra

The rear Senary of Qorqoro house

Manna in the compound

Harra of kimbilita *Kossa*

Picture 5.23 Pictorial analysis of residential compound of Ato Gelebo Bayeto and it shows us the main entrance and exit door (*Harra*), partial view of Qrqoro house and internal compound showing the *Elphign* and frontal view of the hidden Kimbilita Kossa (*Roqa*) main entrance (*Harra*).

***KIMBILITA KOSSA* (*ROQA*)**

Describing about the Konso vernacular houses located in Gaho village, Ato Gelebo said almost all kinds of Konso vernacular housing characteristics are located in Gaho but the stone houses are not found in all of the Konso *palletas* except Gaho and Fasha fortified villages.

Kimbilita (Stone Houses) are of two types. The first one is stone *Paffta (kimbilita Paffta)* and the hidden stone house *(Kimbilita Kossa or Roqa)*. In Gaho, there are two *Pafftas.* The first one is located in all of the Konso *palletas* constructed with thatched roofs and wooden local building material. The other one is constructed with stone as building material which is stone *Paffta (Kimilita Pafta).Kimilita Paffta* is built with stone roof supported by wood and rammed clay soil with a thickness of 24cm. *Kimibilita Paffta* is a *Paffta* functionally different from the thatched roof *Paffta.* The *Kimbilita Paffta* is used to protect the ladies, elders and children from fire, and external attack. Ato Gelebo, describing the second type of hidden stone house called *Kimbilita Kossa (Roqa)*, said it is constructed in individual *Tikka;* built with local building material like supporting stone roofed by wood. Its walls are constructed by stones and the top roof is covered by loom clay soil rammed to the well. And above it, several konso vernacular houses like, *Manna, Elfennotta (Elphign), Kossa* etc are constructed.

Ato Gelebo, describing about function of *kimbilita Kossa*, said like *Kimbilita Paff*ta, it serves as a protection house for the dwellers of each *Tikka;* ladies and young girls form fire & war. On the other hand, *Kimbilita Kossa* serves as storage for farming tools and maternity house of the Konso pregnant women in the hot and dry climate. It is constructed also in harmony with the sloppy landscape of the residential compound *(Tikka*). It is built behind all kinds of housing character in the compound in the lower space of *Arahata.* Kossa (*Roqa*).

Ground floor Plan *(Weybeta)* of Kimbilita Kossa (Roqa)

Lighting and Path way of *Weybeta* at Kimbilita Kossa

Figure 5.22 Graphical analysis of Kimbilita Kossa vernacular house and it shows us the *Kimbilita Paffta* ground floor plan *(weybeta),* light distribution and its path way of *weybeta* functionally used to protection house for the dwellers of each *Tikka;* ladies and young girls form fire.

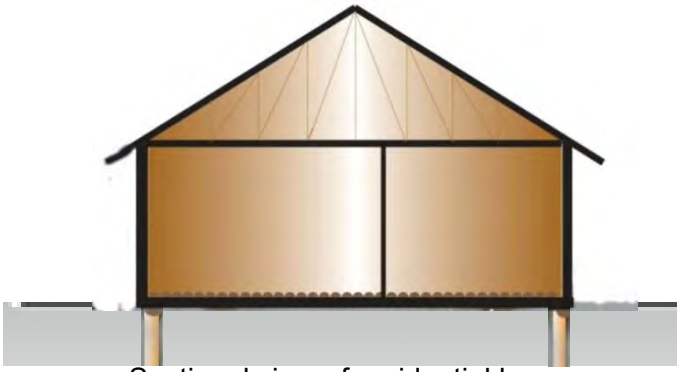
Picture 5.24 Pictorial analysis of entrance and exit *(Harra)* of the *kimbilita Kossa* and it telling us the main entrance of *Kimbilita Kossa*, un mortared dray masonry wall surface and shown supporting stone lintel; the rammed clay roof surface which is used building *Manna* and *Kossa* supported by wooden beams and columns. *Kimbilita Kossa* built in the lower sloppy ground level of *Tikka*.

QORQORO RESIDENTIAL HOUSE

Ground floor Plan

Lighting and Pathway in First floor level

Left side view of Qorqoro residential house



Sectional view of residential house

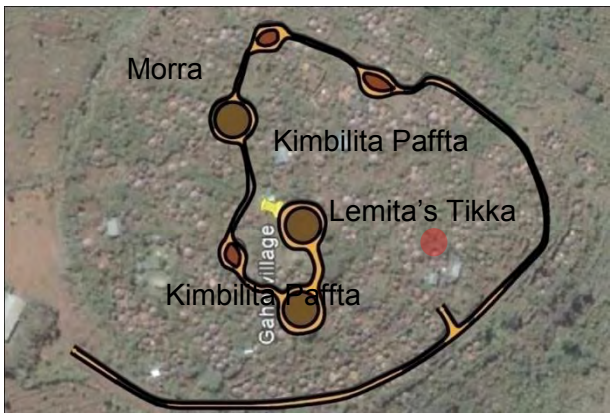
Figure 5.23 Graphical analysis of Qorqoro residential house of Ato Gelebo Beyeto and it show the *Qorqoro* residential house has one floor level functionally serves as storage of house hold goods, sleeping and living proposed the Qorqoro house is built on the lower level of the compound called *Arhata.*

Picture 5.25 Ato Limita kureba Kehencho the interviewee from Fasha.

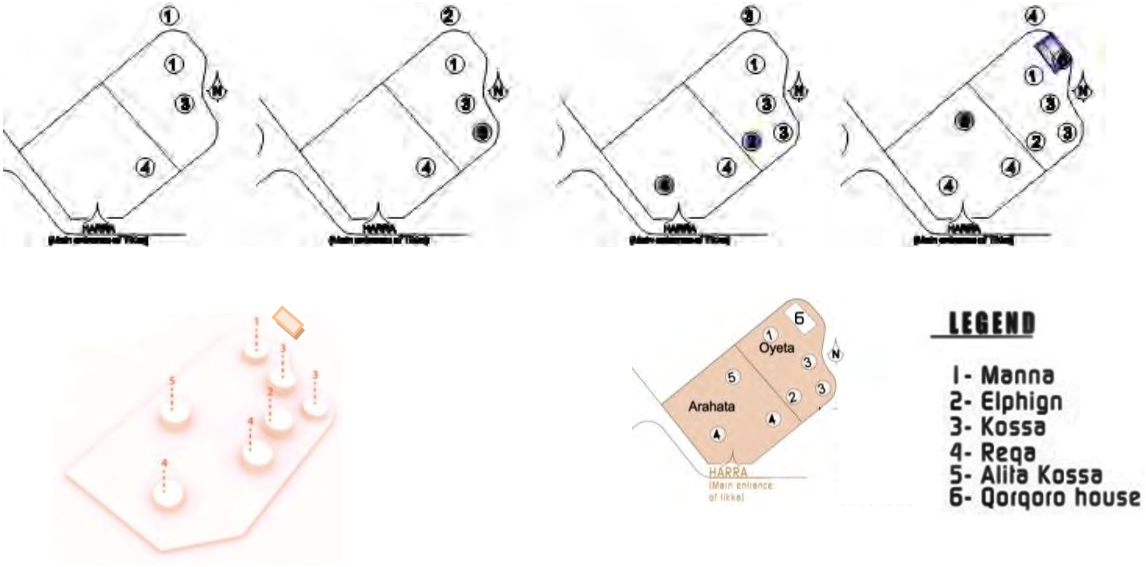
Life history

Ato Lemita Kureba kehencho talked about *Kimbilita Paffta,* Qorqoro house and *Udda (Sonnga)* kitchen housing unit of Konso vernacular house and he is 65 years old he was born in Fasha. He is married and has two adult sons who are also married and have matured young boy ready for marriage and girl respectively. Lemita is the followers of Orthodox religion with his all family together and the best housing expert of the entire Konso vernacular houses technology construction. He also has deep understanding of the vernacular houses and their meanings for the Konso people. Ato lemita is the last born boy for his parent's, he got a small farming land from his father and the residential compound according to the konso people land provisions process.

Ato Lemita does not serve with his small farming land because of these he was making the konso vernacular houses with payment and based on this job he supporting his family.
Lemita add other Konso vernacular houses according to his wealth and necessity; specially he built Elphign for his first born boy when he was ready to marriage and the other Reqa, kossa and Alita Kossa was built by hem and He was present about the vernacular housing unite characters and functional usage Lemita also say about Kimbilita Paffta and Alita Kossa. The totally transformed Qorqoro house for storage function of farm equipments and fire wood is located in his compound constructed before 22 years by his first married son after he was buck to konso after working of traditional Gold mining job from Adolla.



Sketch map of Gaho walled vilage



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Sketch 5.9 sketch analysis of Konso vernacular houses located in residential compound *(Tikka)* of Ato Limita kureba Kehencho and it express us the Konso vernacular houses construction time intervals in Ato Limita kureba Kehencho's residential compound *(Tikka).*

Qorqoro storage house | Residential compound | Accuess of Affda | Gridding process

Picture 5.26 Pictorial analysis of residential compound of Ato Lemita Kureba and it describing us the aged storage Qorqoro house, partial view of the *Tikka*, the gridding process under the shade of *Kossa* and the storage basket *(Engulla)* is located the *kosss.*

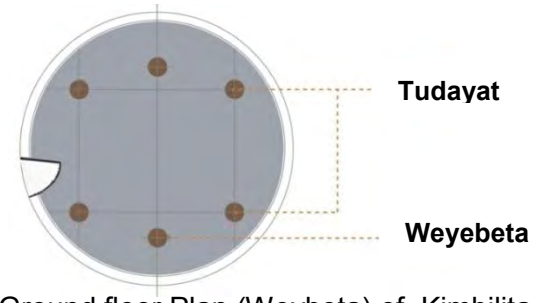
KIMBILITA PAFFTA

Describing about the Konso vernacular houses located in Gaho village, Ato Limita said all of the Konso vernacular housing units are located in Gaho walled village but the stone housing units are not found in all of the Konso Palletas except Gaho and Fasha fortified villages.

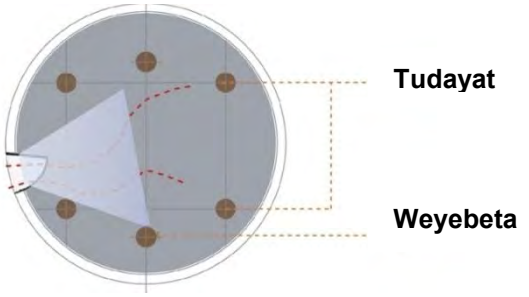
The major communal konso vernacular stone housing unit constructed with local building material like stone, wood and rammed clay soil for roofing purpose is called *kimbilita Paffta.*

In Gaho, there are two housing characters of *Pafftas.* The first one is located in all of the Konso *Palletas* constructed with thatched roofs and wooden local building material. The other one is constructed with stone as building material which is stone *Paffta (Kimilita Paffta). Kimilita Paffta* is built with stone roof supported by wood and rammed clay soil with a thickness of 24cm. *Kimibilita Paffta* is a *Paffta* functionally different from the thatched roof *Paffta.* The *Kimbilita Paffta* is used to protect the ladies, elders and children from fire, and external attack.

KIMBILITA PAFFTA

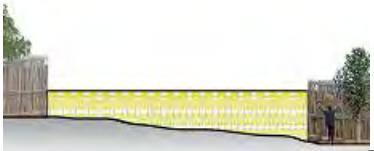


Ground floor Plan (Weybeta) of Kimbilita Paffta

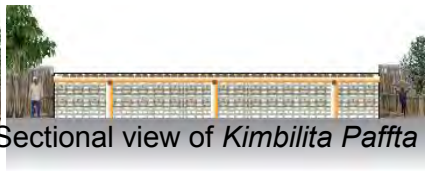


Lighting and Path way of Weybeta at Kimbilita Paffta

Front view of Kimbilita Paffta



Side view of Kimbilita Paffta



Sectional view of *Kimbilita Paffta*

Figure 5.24 figerical analiysis of *Kimbilita Paffta* and it show us the *Kimbilita Paffta* floor plan, lighting and path way, typical side view, front view and sectional details of *Kimbilita Paffta*

.

The rammed roof top, Main entrance and exit of Kimbilita Paffta

The interior pictorial presentation of Kimbilita paffta

Picture 5.27 Pictorial analyses of the external and internal views of *kimbilita Paffta* and it shows the external stone wall surface & the rammed clay roofing building part, internal roofing beam and column support of *Kimbilita Paffta* built on the sloppy communal space called *Morra*

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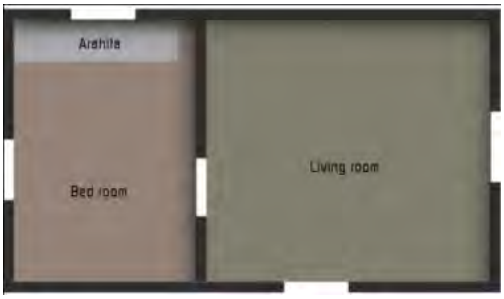
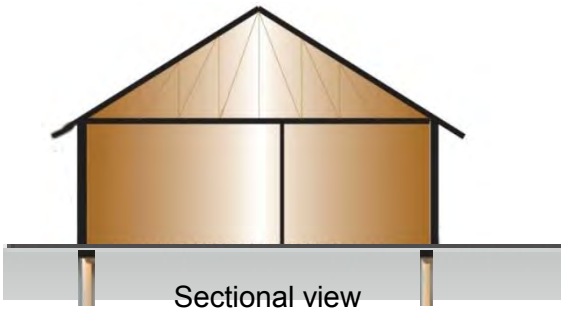
QORQORO RESIDENTIAL HOUSE



Ground Floor Plan

Lighting and Pathway in Ground floor level

Side Views

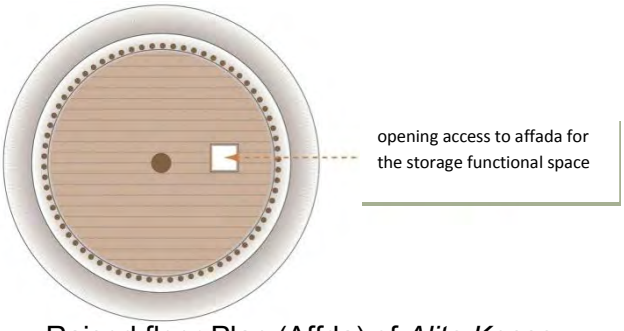


Sectional view

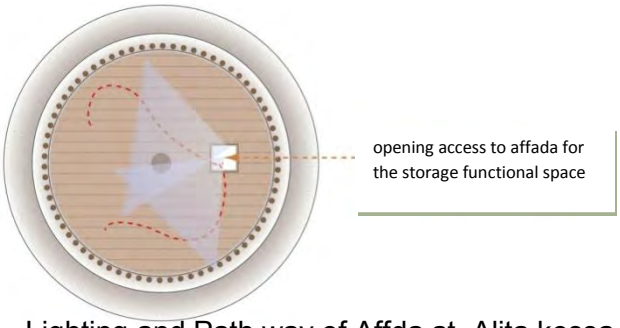
Figure 5.25 Graphical analysis of Qorqoro residential house of Ato Limita kureba and it show the *Qorqoro* residential house has one floor level functionally serves as storage of house hold goods, sleeping and living proposed the Qorqoro house is built on the upper level of the compound called *Oyeta.*

ALITA KOSSA

Ato Lemita, describing about *Kossa* vernacular houses, said there are two types of *Kossa* in *Konso*. The first one is *Kossa* itself and the second is *Alita kossa*. Lemita describing about the vernacular housing character of *Alita Kossa* is built on the lower ground floor level of the Tikka. *Alita Kossa* is standing on it with one dry large perennial woody tree the thatched roof surface is lay on it n the perennial branched drat wooden column.. Under *Alita kossa* constructed the dry masonry rounded wall surface with the height of 45-60 cm. It serves as a shade space for outdoor home services and for goats and sheep rests. Most of the time, the Konso people ladies take rest under *Alita kossa* in hot climatic condition and work their home job and drink *Cheka* (local beer).



Raised floor Plan (Affda) of *Alita Kossa*



Lighting and Path way of Affda at Alita kossa

Sectional view of Alita Kossa

Typical elevation of Alita Kossa

The shading space of Alita Kossa

Figure 5.26 Graphical analysis of Alita Kossa vernacular house unit and it show us the *Alita kossa* section, elevation and pictorial presentation and the shading space at ground floor level facilitates by dray masonry wall.

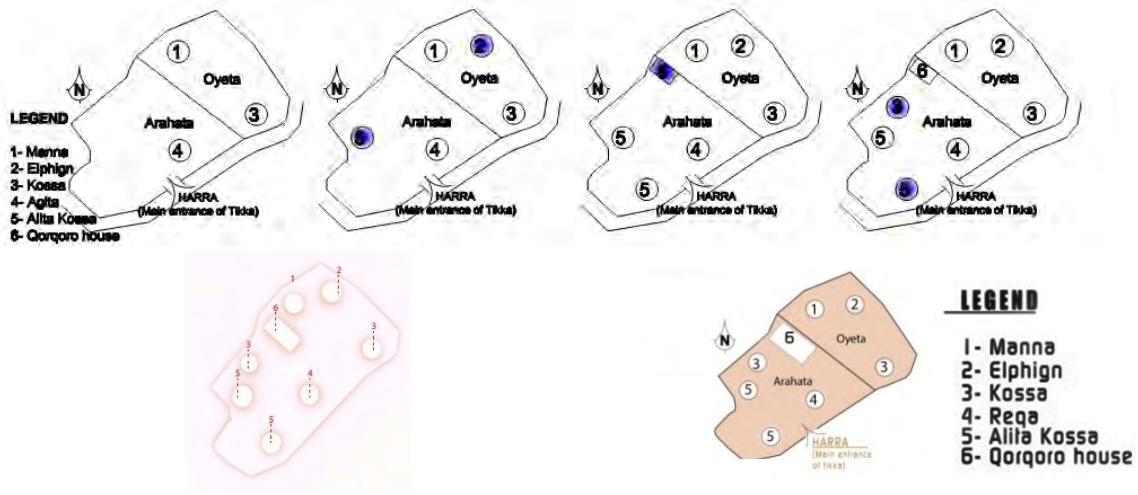
Picture 5.28 Ato Dirro Kiffo the interviewee from from Gaho walled village.

Life history

Ato Dirro kiffo is 57 years old talked about the two housing characters of *Kossa*s and born in Gaho.Dirro is the respected housing expert in Gaho walled village. He is doing several housing characters of Konso vernacular houses in Gaho and Fasha mostly but because of his deep knowledge of vernacular housing construction system and their symbolic meaning Dirro was primary selected housing expert in the whole Konso society and he was doing the Konso vernacular houses in some of the Konso walled villages.

He was build *Elphign* and *Alita Kossa* housing units in his residential compound after he got the first three housing units gift from his parent's he add Kossa and *Alita kossa* after

several years but his first married son was built the small in size Qorqoro housing unit for storage of farm equipments and dry fire wood using for coking purpose but mostly his son was living in his father *Elphign*. Ato Dirro is the forth born gentleman for his parent's and married; he has three boys and two mature ladies were married and one girl is ready to make marriage correspondingly. He was talked about the two *Kossas* housing unites similar function, having ground and raised floor surface, and different forms both of them are located in all of the Konso homestead but most of the time the Gaho dweller choose the closed housing unit of *Kossa.*



Sketch 5.10 sketch analysis of Konso vernacular houses located in residential compound (*Tikka*) of Ato Dirro Kiffo and it express us the Konso vernacular houses construction time intervals in Ato Dirro Kiffo's residential compound (Tikka).

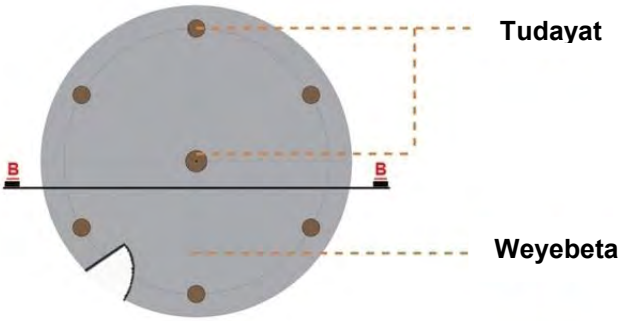
Semibasement functional Space at Arhata ground level | Rear view of Qorqoro house | Harra | Grinding stone

Picture 5.29 Pictorial analysis of the residential compound of Ato Dirro Kiffo and it show us the main entrance of *Tikk*, grindding stone was located under the shade of kossa and buck side view of totally transformed Qorqoro residential and storage house.

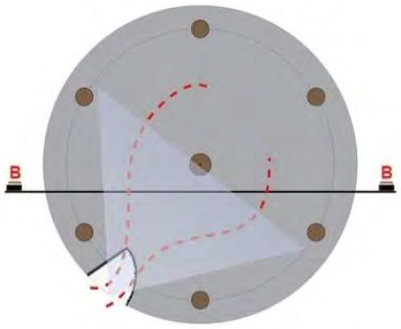
KOSSA* and *ALITA KOSSA

Ato Dirro, told about *Kossa* vernacular houses, in his presentation there are three storage housing characters of *Kossas* in Fasha walled village. The first one is *Kossa* itself, the second is *Alita kossa* and the third housing unit is *Kimbilita Kossa*.

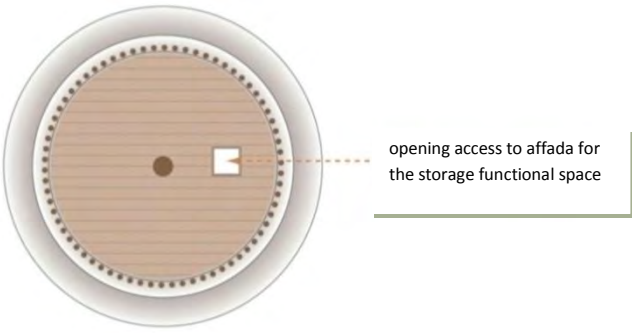
The *Alita Kossa* and *Kimbilita Kossa* are built in lower ground floor level called *Arhata,* but the main *kossa* is located in both area of konso residential compound in *Oyeta* and *Arhata. E*xcept *Kimbilita kossa* Ato Dirro said both *kossas* have two floor levels and thatched roof surfaces the upper floor level of the main *Kossa* has wooden wall surface and covered with thatched roof cover creates the storage function of farm products and the lower floor level is two types of housing units the first housing unit doesn't has closed wall surface but the second housing character is built with vertical wood pine some of them are internally their wall surfaces are finishes with cow dung; functionally serves as a shade space of cattle; *Alita kossa* is majorly serves for the shade housing character in the hot climatic season specially for the ladies outdoor homemade work under the thatched roof surface and the upper storage floor is functionally serves to farm equipments. Both of them are constructed with local building materials and in each and every homestead have more than two main *kossas* in their *Tikkas* according to the occupants.



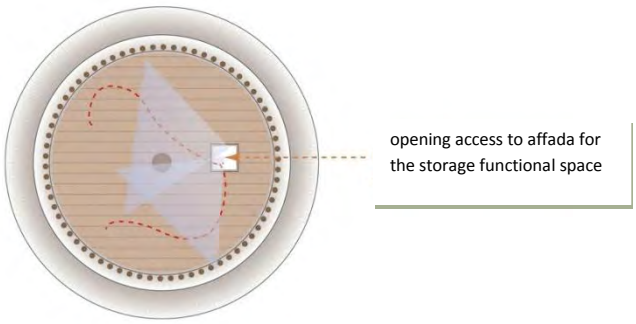
Ground Floor Plan *(Weyebeta)*



Lighting and Pathway in *Weyebeta* floor level



First floor plan *(Affda)* of *Kossa*



Lighting and Pathway in *Affda* floor level

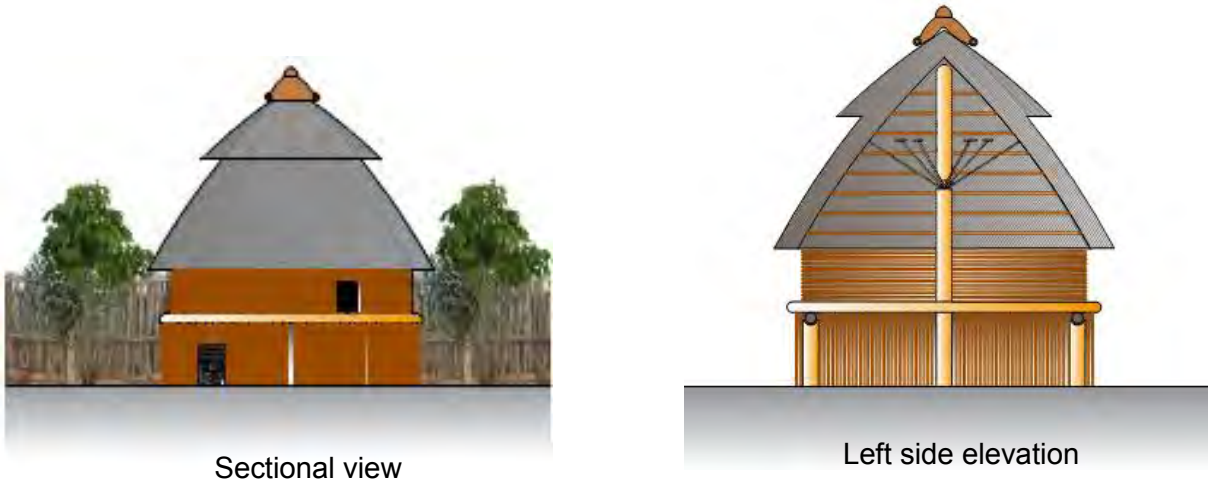
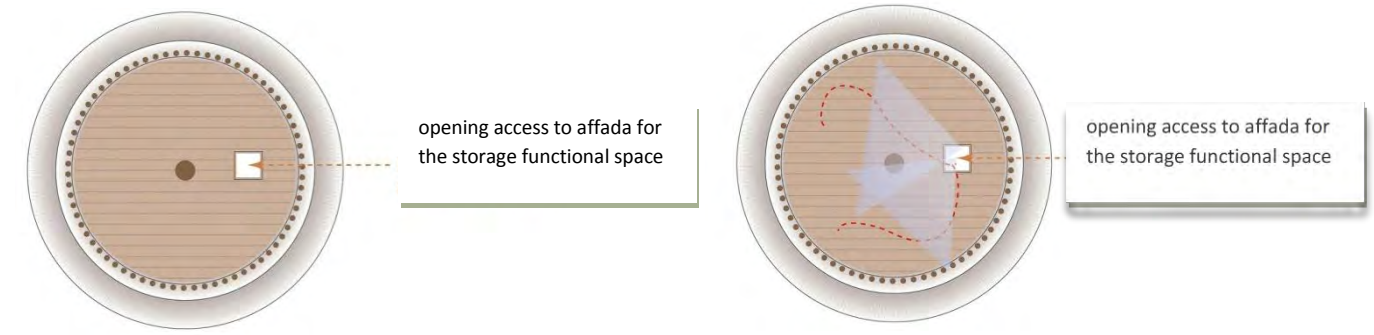


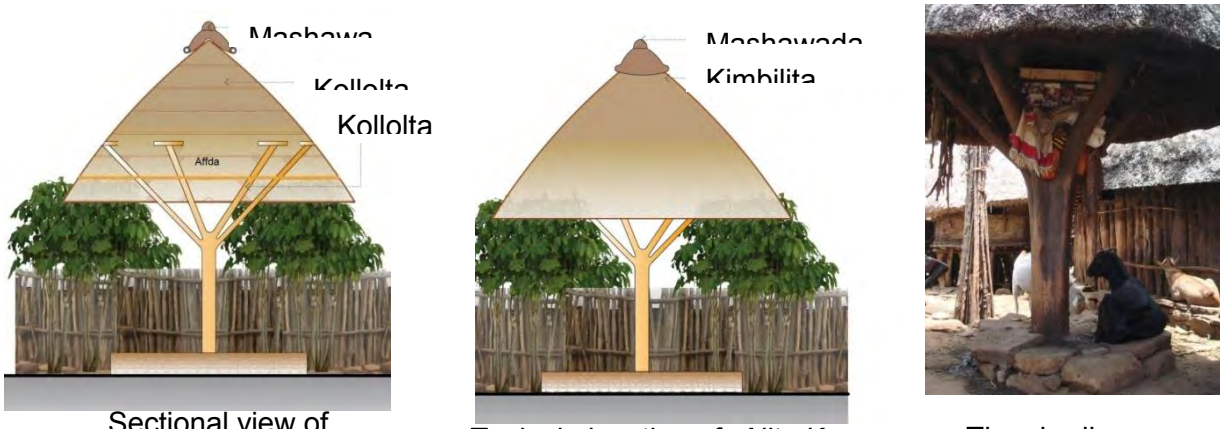
Figure 5.27 Graphical analysis of *Kossa* vernacular house and it shows the storage functional graphical presentation of the two floor level of *Kossa* and has the closed cattle shade space at the ground floor level and storage functional space at the first floor level.

ALITA KOSSA



First floor Plan *(Affda)* of *Alita Kossa*

Lighting and Path way of *Affda* at *Alita kossa*



Sectional view of Alita Kossa

Typical elevation of *Alita Kossa*

The shading space of Alita Kossa

Figure 5.28 Graphical analysis of Alita kossa vernacular house and it show us the *Alita kossa* section, elevation and pictorial presentation and the shading space at ground floor level facilitates by dray masonry wall.

QORQORO RESIDENTIAL HOUSE

Ground floor plan (Weybeta)

First floor plan *(Affda)*

Lighting and Path way of Qorqoro house

Left side elevation

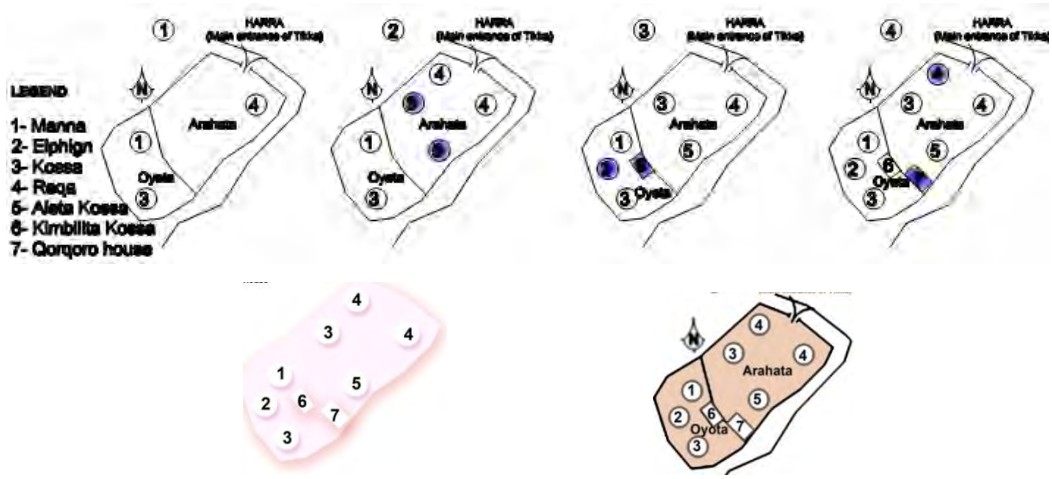
Sectional view

Figure 5.29 Graphical analyses of Qorqoro residential house of Ato Dirro Kiffo and it show us the analysis of the lower floor level is used for storage for farm products, house hold goods and shelter for cattle, the upper level is used for sleeping, living and a small area of it is used as storage facilities. The Qorqoro house is built on the lower level of the compound called *Arhata.*

Picture 5.30 Ato Denfo Kinna and W/ro. Koyie Ayello are husband and wife.

Life history

Ato Denfo is 32 years old and his wife is 29. He was born in Fasha and his wife is from Gaho having two Childers seven years' old daughter and five years old boy. Koyye Ayello is the second daughter of her parents; she is living with him in Denfo's father residential compound based on Konso culture. In Konso the first born boy is living with his parents if he was even married. His father was preparing living home for his son and his wife in his compound. Ato Denfo is a farmer and the fifth born person but he is the first born boy for his parent's. Ato Denfo was remember the additional new *Kossa* and *Alita kossa* konso vernacular houses were built before ten years and then the *Elphign* housing units built for hem and his new married to live together and Denfo was built the *Reqa* and *Udda (Songga)* Konso vernacular house. *Udda* housing unit is very important in Konso residential compound when the Father and his new marred son were living together. He was representative of his father's family because of his father was a sick person for long time. Denfo present about the hidden and storage housing character called *Kimbilita kossa*.



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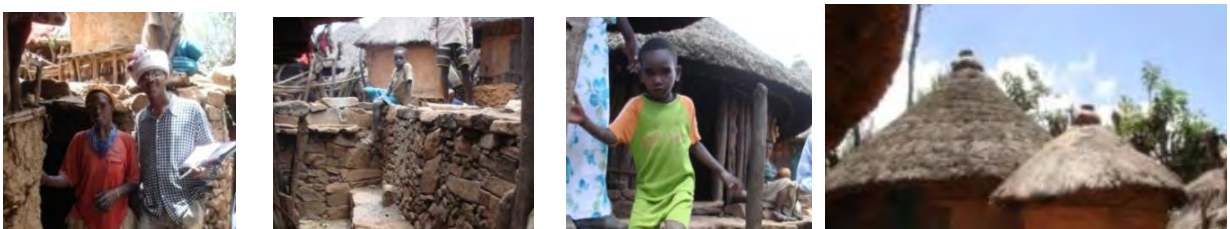


Kimbilita Harra | Masonary | Stair case | Elphign and Kossa

Sketch 5.11 analysis of Konso vernacular houses located in residential compound *(Tikka)* of Ato Denfo Kinna and it express us the Konso vernacular houses construction time intervals in Ato Denfo Kinna residential compound *(Tikka).*

Picture 5.31 Pictorial analysis of internal compound set up of Ato Denfo Kinna and it describing us the main entrance of *Kimbilita Kossa (Harra),* un mortared dry masonry wall separate and support the upper compound floor level *(Oyeta)* and the lower floor surface of the *Tikka (Arhata),* the dray stone stair case connect the *Oyeta* and *Arhata, Elphign,* and *kossa* housing units are set according to chronological order of the Konso.

***UDDA* (*SONNGA*)**

Ato Denfo describing about *Udda (Sonnga)* housing unit built in the lower level of the residential compound of konso people. *Udda (Sonnga)* is functionally uses as kitchen for food preparation, grinding farm products and storage function of fire wood. *Udda* has thatched roof surfaces and wooden wall surfaces moreover it has also an opening building elements of door and windows. The internal wooden wall surface built by mud plastering and finishes with Cow dung. *Udda* is constructed by local building material like the other Konso

vernacular houses but half of the wooden wall is built by vertical wooden pine only. Udda housing unit is very important in Konso residential compound when the Father and his new marred first son were living together.

***UDDA* (*SONNGA*)**

Elevation of *Udda*

Sectional of *Udda*

Ground floor plan *(Weybeta)*

Figure 5.30 Graphical analysis of *Udda (Songga)* Koso vernacular house and it shows us the floor plans, lighting and path way in ground floor, front and sectional view of the figure and the kitchen, storage and grinding functional space of Udda (Songga) Konso vernacular houses.

***KIMBILITA KOSSA* (*ROQA*)**

Ato Denfo Kinna describing about the Konso vernacular houses located in Fasha fortified village, believed almost all of the Konso vernacular housing units are to be found in Fasha including *Kimbilitas*.

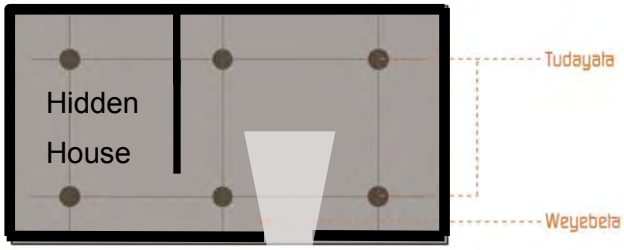
The stone *Paffta (Kimbilita Paffta)* and the hidden stone house *(Kimbilita Kossa or Roqa)* are the two stone housing units are only located in Gaho and Fasha fortified villages. In Gaho and Fasha, there are two *Pafftas.* The first one is constructed with thatched roofs and wooden local building material located in all of the Konso *Palletas*. The second *Paffta* housing unit is constructed with stone, wood and red clay soil is the major local building material which using for stone *Paffta (Kimilita Pafta).*

Ato Denfo says the second type of hidden stone house called *Kimbilita Kossa (Roqa)* is built in all of the individual *Tikka* having sloppy ground surfaces of the residential compound*;* built with local building material at the bottom of the rammed soil roof by wood, the walls are make by dray stones masonry built without cement mortar and the top roof is covered by

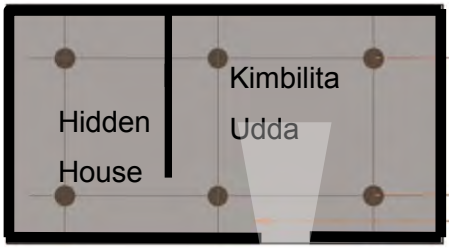
loom clay soil rammed above the supporting wooden beams. The other housing unites like *Manna, Elfennotta (Elphign), Kossa* etc built above the *Kimbilita Kossa*.

Ato Denfo, describing about purpose of *kimbilita Kossa* it serves as a protection house for the dwellers of each *Tikka;* ladies and young girls form fire & war. On the other hand, *Kimbilita Kossa* serves as storage for farming tools and maternity house of the Konso pregnant women in the hot and dry climate. It is constructed also in harmony with the sloppy landscape of the residential compound *(Tikka*). It is built in the compound in the lower compound space of *Arahata.*

***KIMBILITA KOSSA* (*ROQA*)**



Ground floor Plan (Weybeta) of Kimbilita Kossa (Roqa)



Lighting and Path way of *Weybeta* at Kimbilita Kossa

Main entrance and exit opening *(Harra)*

Un mortared dry masonry wall built at Arhata

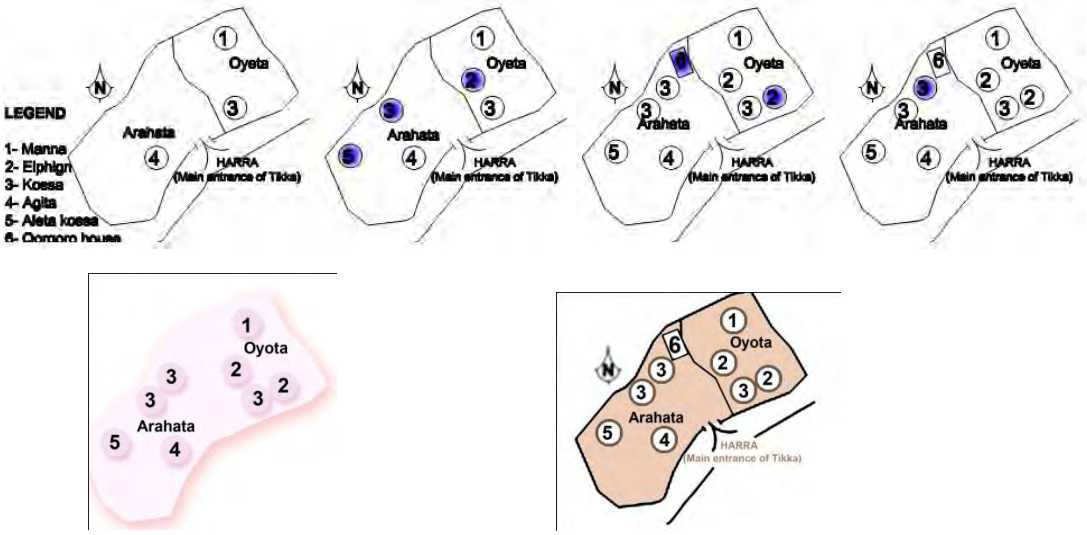
Picture 5.32 Pictorial and graphical analysis of kimbilita Kossa and it telling us the main entrance of *Kimbilita Kossa*, un-mortared masonry wall surface and shown supporting stone lintel and the sketch map of internal floor space of *Kimbilita Kossa*.

Picture 5.33 Ato Zenebe Gwaro Oshona talked about the Kossa and Udda Konso vernacular housing unites.

Life history

Ato Zenebe is 68 years old and the Konso vernacular housing expert and respected elder in Fasha and Gaho. Zenebe is exceptionally specializing in all of the konso vernacular houses of wooden structure and the thatched roof construction method. He was participated for most of the construction of *Pafftas* housing units located in all of Konso fortified village as an advisor of the wooden structure of the supporting beams, columns and roof structure.

Ato Zenebe has good knowledge of the tradition and Norms of konso people based on these he was made several Konso housing character in his *Tikka* according to the konso culture and norms. Ato Zenebe is also strong farmer but he has small in size farming land in Fasha and he was doing several Konso housing units in Fasha and Gaho to get good money for supporting his large family. Because of his low income small farming land two young boys including his first born boy was working in Arbaminch and karat town. Zenebe's first born son built Qorqoro residential house in his father's *Tikka* because of shortage of enough money to built *Manna* or *Elphign* and he got some living experience in Qorqoro house is the sign of modernism.



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Sketch 5.12 sketch analyses of Konso vernacular houses located in residential compound (Tikka) of Ato Zenebe Gewaro and it express us the Konso vernacular houses construction time intervals in Ato Zenebe Gewaro residential compound *(Tikka).*

Rear view of *Tikka*

Kossa

The lady drinks Cheka Kossa

Harra

Engulos under the shade of *Req*

Picture 5.34 Pictorial analysis of residential compound of Ato Zenebe Gewaro and it describing us the rear view of *Tikka*, *Engulos* under the shade of *Reqa,* main entrance of *Tikka (Harra),* the old *Manna*s shows partial views of *Kossa* and the lady drink the local beer called *Check* under the shad of *Elphign.*

KOSSA* and *UDDA

Ato Zenebe, describing about both Konso vernacular house of *Kossa* and *Udda*, said there are two types of *Kossas* and *Uddas* in Konso. The first one is *Kossa* itself and the second is *Alita kossa*, based on *Uddas* Zenebe presets *Uddas* are two types having circular and rectangular form of walls construction.

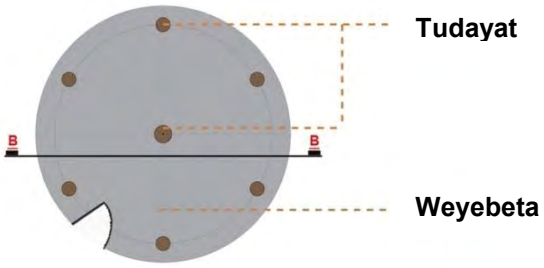
*Kossa*s have two floor surfaces, the *Weybeta* and *Arhata*. The *Weybeta* floor space is secure by circular wooden wall surfaces and don't have wooden wall construction, the *Weybeta*s are functionally uses for cattle shade and *Arhata* is storage functional space. *Kossa* is built in both of the residential compound spaces and located in all of the konso *Tikkas.*

Kossa is built additional in each of the konso inhabitants according to the wealth of the owner, *Kossa* is built by using local building material like Wood for structural part of the building and roof structures, Grass for making thatched roof surfaces, stone for *Weybeta* floor finishing and Cow dung for wall finishing of the internal surfaces of *Affda* storage spaces.

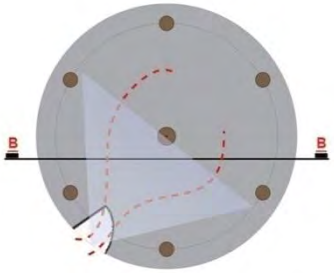
Udda is built in *Arhata* floor level of the *Tikka*, and built with local building material like wood grass, smooth stones and Cow dung. *Udda (Sonnga)* is functionally serves as mainly for

kitchen purpose, Storage and grinding of farm products for food processing. *Uddas* have two wall surface forms the rectangular and circular wall form. In most of the konso homestead *Udda* housing units are circular in form. It is built in all of the father and his first new married boy living together compound space.

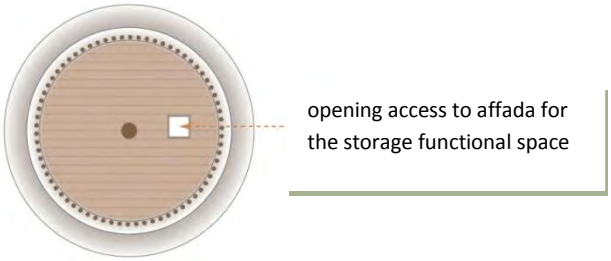
KOSSA



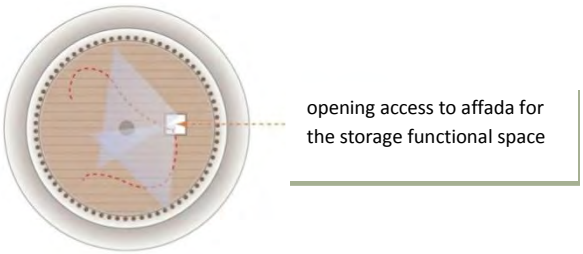
Ground Floor Plan *(Weyebeta)*



Lighting and Pathway in *Weyebeta*



First Floor Plan *(Affda)*



Lighting and Pathway in *Affda*

Sectional View of *Kossa*

Elevation of *Kossa*

Figure 5.31 Graphical analysis of Kossa vernacular house and it shows us the closed cattle shade space at the ground floor level and storage functional space at the first floor level, elevation and sectional views of *Kossa.*

***UDDA* (*SONNGA*)**

Elevation view of *Udda*

Sectional view *Udda*

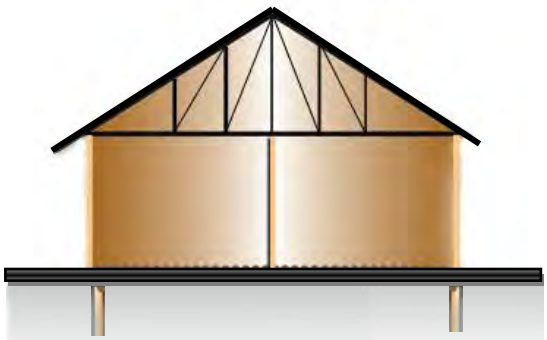
Ground floor plan *(Weybeta)*

Figure 5.32 Graphical analysis of *Udda* (*Sonnga*) vernacular house and it shows us the ground floor functional space of kitchen, storage and grinding space, lighting and Pathway in weybeta floor level of Kossa.

QORQORO RESIDENTIAL HOUSE

Ground floor plan *(Weybeta)*

Lighting and Pathway in *Weybeta*



Sectional view of Qorqoro house

Front elevation Qorqoro house

Figure 5.33 Graphical analysis of Qorqoro residential house of Ato Denfo Kinna and it shows us the totally transformed Qorqoro house functionally use for storage purpose of farm equipments grass for cattle food and fire wood like his friend living in the same *Kanta* and also to show he has good awareness of the modern living situation.

5.13.SUMMARY OF FOCUS GROUP DESCUSSION WITH KONSO ELDERS

The konso elders are describing about several Konso vernacular housing characters, located in Fasha and Gaho walled village like describing the study area of case one, in terms of the konso vernacular housing function, building location, chronological order, building material, form of the building and the vernacular houses symbolic meaning.

Kalla Gezaghn is the moderator for our focus group discussion, clan leader and traditional king of Konso; between the Konso elders and Konso vernacular housing experts separately and the desiccation done together the elders and housing expertise.

Ato Robo is one of the Konso elder he was described about the Konso vernacular housing character of *Kimbilita Paffta.* Robo said there are two different in function and form of the stone building located in Fasha and Gaho. The most important *Paffta* housing unit is like before seen in case one are the same *Paffta* (Communal) housing character is built on the communal open space called *Morra*. It has two floor levels functionally uses for the community social services like elders judge under the shade of *Paffta* if any inconsistency between the inhabitants of konso people, uses as a land mark of every *Kanta*, control post for every walled villages of konso. He was also said about the second housing unit of *Kimbilita Paffta*; It is built in the communal open space called *Morra. Kimbilita Paffta* is constructed by the community controlled and lead by Konso elders and konso vernacular housing experts.

Ato Lemita kureba one of the Konso elders and housing expert describing about the Konso vernacular houses located in Gaho and Fasha walled village like case one are the same in functional usage, building form and building construction materials but the *Kimbilita* housing units are only built in Gaho and Fasha walled villages, these stone houses are constructed at the communal sloppy open space and in the individual inhabitant sloppy residential compound called *Tikka*.

The major communal konso vernacular stone housing unit is called *kimbilita Pafta.* In Gaho, there are two housing characters of *Pafftas.* The first one is located in all of the Konso *Palletas* constructed with thatched roofs and wooden local building material. The other one is constructed with stone as building material which is stone *Paffta (Kimilita Pafta).*
Kimilita Paffta is built with local building material like stone, wood and rammed clay soil. Its function is different from the thatched roof *Paffta.* The *Kimbilita Paffta* is used to protect the ladies, elders and children from fire, and external attack.

Ato Zenebe Gewaro describing about *Kossa* and *Udda* housing characters, both of the housing units are share the same function like storage. Kossa has two floor levels and constructed by local building material like Grass for thatched roof, Wood serves for column, vertical roofing beam, horizontal roofing beam and the upper floor finish, Stone building material is utilize for ground floor finish and Mud mixed uses for wall finishing. Ato Zenebe say about *Udda* housing unit function is used as a kitchen, grinding the farm products for food processing and storage of dray fire wood.

Ato Denote is an elder and tourism expert describing about *Udda* is built in the lower ground floor surface of the *Tikk*a called *Arahata*, *Udda* is two type in building forms rectangular and circular in wall surfaces both of them are construct their wall by vertical wood pine half of the wall surface is plastered internally by cow dung and the floor finished is Mud mix. Its roofing is constructed by thatched roofing.

Ato Denfo Kinna describing the stone *Paffta (Kimbilita Paffta)* and the hidden stone house *(Kimbilita Kossa or Roqa)* are the two stone housing units are only located in Gaho and Fasha fortified villages. Ato Denfo says the hidden stone housing unit called *Kimbilita Kossa (Roqa)* is built in all of the individual *Tikka* but having sloppy ground surfaces of the residential compound*;* construct with local building material like wood, dray stones masonry built without cement mortar and loom clay soil. The other housing unites like *Manna, Elfennotta (Elphign), Kossa* etc built above the *Kimbilita Kossa* and also describing the function of *kimbilita Kossa* it serves as a protection house for the dwellers of each *Tikka;* ladies and children from external enemies. On the other hand, *Kimbilita Kossa* serves as storage for farming tools and maternity house of the Konso pregnant women in the hot and dry climate. It is built in the lower compound space of *Arahata.*

Picture 5.35 Focus group discussion with Konso elders and show us the elders focus group desiccation under the shade of *Reqa* in Kalla Gezaghn Residential compound *(Tikka).*

5.14.SUMMARY OF FOCUS GROUP DISCUSSION WITH KONSO VERNACULAR

5.15.HOUSING EXPERTS

The Konso Vernacular houses are constructing with local building material; for the roof structure and cover, column, and wall surfaces of several housing units and built by their own local housing construction experts. The experts have their own specialization of the roof structure and cover has its own experts; column, beams structural and the other wall constructions also have dedicated experts. The experts are doing their work in all of the Konso traditional fortified villages. The housing experts do their work by being coordinated with respected elders and that helps them to keep the value, norms and the symbolic meaning of the konso vernacular houses. The *Mana, Reqa* and *Kossa* konso vernacular houses are built by the family for their sons after the first son of the family. Before construction the family collects the local building material from their own farm and market within a minimum of one year in one of their relative's house. With regard to residential buildings the newly married son constructs the other housing units, other than the three, according to his need.

The housing expertise are build the Konso vernacular houses based on the symmetrical housing construction system but some of the vernacular houses have slightly and totally differentiation in the construction system, housing character and forms. The housing expertise describing the construction system of *Manna, Agita, Reqa* and *Paffta* like case one but there are three housing units are presenting the construction system of *Kimbilita* housing units.

Construction system of *Kimbilita Paffta*

Ato Limita describing about most of the Konso vernacular houses construction system are more or less similar except Kimbilita housing units. Kimbilitas are the stone housing units of Konso vernacular houses. Lemita said Kimbilita Paffta is the communal housing unit constructed in the communal open space of each Kantas. Before construct Kimbilita Paffta every inhabitants collect the local building material minimum of one year by coordinating of Konso elders and housing experts.

Ato Dirro said *Kimbilita Paffta* construction system is starting by choosing the sloppy communal construction site and gets ready the excavation for the six wooden columns having maximum depth of 60cm. and placing in the digging hole then the circular dry masonry wall construction will be built and the *Harenda* (roof supporting beam) are lay on

the top of the column, the *Sittas* (horizontal wooden roof finishes) are fixed on the above of the *Harenda* after these stapes the wall construction will be built up to the edge of the *Sittas* and the *Aguma* (Rammed clay red soil) are done on the top of the *Sittas; Aguma* is the soil roof type of *Kimbilitas*.

Ato Denffo add the communal konso vernacular stone housing unit constructed with local building material like stone for wall surfaces, wood for beam and column and rammed clay soil for roofing purpose.

Construction system of *Kimbilita Kossa* (*Roqa*)

Ato Denfo Kinna describing about the hidden stone house *(Kimbilita Kossa or Roqa)* are only located in Gaho and Fasha fortified villages. *Kimbilita Kossa (Roqa)* is built in all of the individual *Tikka* having sloppy ground surfaces of the residential compound*;* built with local building material at the bottom of the rammed soil roof supporting by *Harenda* and column and the walls are make by dray stones masonry built without cement mortar and the top roof is covered by loom clay soil rammed above the *Sittas* (wooden roofing finishes) wooden beams. The other housing unites like *Manna, Elfennotta (Elphign), Kossa* etc built above the *Kimbilita Kossa*.

Ato Gelebo, describing about purpose of *kimbilita Kossa* it serves as a protection house for the dwellers of each *Tikka,* storage for farming tools and maternity house of the Konso pregnant women in the hot and dry climate. It is constructed also in accordingly with the respect of sloppy landscape of the residential compound *(Tikka*). It is built in the compound in the lower compound space of *Arahata.* Interims of construction system the same as *Kimbilita Paffta.*

Construction system of *Udda* (*Sonnga*)

Ato Denfo and Denote Kusia have the same description about *Udda (Sonnga)* housing unit built in the lower level of the residential compound *(Tikka)* of konso people. *Udda (Sonnga)* has two building form the circular and rectangular in shapes; most of the time the Konso people choose the circular housing unit without *Affda* floor level. *Udda* is built by local building material Grass for thatched roof surfaces, wood for roofing beam, walls and columns, Mud and Cow dung uses for internal wall plastering and finishes.

Ato Lemita add *Uddas* are one of the two konso vernacular house having wooden windows and half of the wall surfaces are nor plastered it is important for ventilation purpose in the time of food cooking in *Udda. Udda* is mostly uses for Kitchen function.

Ato Zeneb describing the construction system of *Udda* is first start the wooden wall surface is built and the central column is go on construction then the roofing beams are fixed from the top of the column to the wooden column top edge the diagonal roof supporting beams are fixed between the column and the inclined roof beams and the thatched roof construction is make on the inclined roof wooden surface and finally the internal wall mud plastering and cow dung wall and floor finishing work is donning.

Construction system of *Elfennotta* (*Elphign*)

Ato Zenebe said about Elfennotta (Elphign) housing unit the internal functional space is better than the other Konso vernacular houses and it has also door and window openings are made properly. Its construction system is starting by making in proper position the central column (Tudata) is the major one then the circular wooden wall construction and the inclined roofing beams are lay on the top edge of wooden wall and central Tudata, the diagonal roof supporting beam (Kollolta) is fixed between the Tudata and inclined roofing beam and the thatched roof construction system is starting from the bottom to the top edge of the column (Tudata) .

Ato Dirro add about the finishing of wall construction system of Elphign is make by Mud plastering for internal and external wall surfaces and finishes with Cow dung. The floor surface is finishes by Cow dung after all construction works are completed.

Picture 5.36 Focus group discussion with Konso Vernacular housing experts and it show us the three housing experts on the focus group discussion facilitate and interpret by Kalla Gezaghn in his residential compound *(Tikka).*

The major and the sub- detail filters are shown as follows:-

- **Original Konso vernacular housing character, function and their meaning.**

  Location of Konso vernacular houses.

  Building material.

  Symbolic meaning.

  Housing character.

  Functional usage.

  Climate

Major Function	Konso vernacular housing character	Remark
Sleeping	Elfennotta, Manna, Paffta, and Reqa	Most of the Konso vernacular houses are classify by three major function like Sleeping, Storage and Communal
Storage	Kimbilita Kossa, Kossa, Alita Kossa, and Agita	
Service	Udda (Sonnga), Manna and Reqa	
Communal	Paffta	

Table 5.12 Major function of original konso vernacular houses and shows us the analysis of konso vernacular houses classified in three major function of sleeping, residential and communal.

Housing character	Major building materials									
	Floor finish			Wall finish				Roof finish		Remark
	Cow dung	Stone	Wood	Thatched wall	Mud & wood	Wood pine	Masonry wall	Thatched and wooed	StonStone & ram med soil	
Alita. Kossa	-	-	yes	-	-	-	-	Yes		
Agita	Yes	-	yes	Yes	-	-	-	Yes		
Eliphign	Yes	-	-	-	yes	-	-	Yes		
Kossa	Yes	Yes	yes	-	yes	yes	-	Yes		
Manna	Yes	Yes	-	Yes	-	-	-	Yes		
Paffta	-	Yes	yes	-	-	-	-	Yes		
Reqa	Yes	Yes	yes	-	-	-	-	Yes		
Kimbilita kossa	Yes	Yes	-	-	-	-	Yes	-	Yes	
Kimbilita Paffta	-	Yes	-	-	-	-	Yes	-	Yes	

Table 5.13 Local building material of konso vernacular houses and it explain us the analysis's of local building material usage like Stone, wood and Thatched building materials are the most essential for the konso Socity.

Housing character	Residential compound of Konso		Several residential compound			Comunal space (Morra)	Remark
	Oyeta	Arahata	Clan	Religious leader	Konso dwellers		
Alita. kossa	-	Yes	-	-	yes	-	
Agita	-	Yes	Yes	yes	-	-	
Eliphign	Yes	-	-	-	yes	-	
Kossa	Yes	Yes	Yes	yes	yes	-	
Manna	Yes	-	Yes	yes	yes	-	
Reqa	-	Yes	Yes	yes	yes	-	
Kimbilita kossa	-	-	-	Yes	Yes	-	
Kimbilita Paffta	-	-	-	-	-	Yes	

Table 5.14 The Chronological order of Konso vernacular houses and it describing us the analysis of the location of Konso vernacular houses like Kossa, Manna and *Reqa* are the most important housing units in Konso society.

5.16.REASON FOR TRANSFORMATION OF KONSO VERNACULAR HOUSES.

Using the focus group data collection tools presetting by Konso elders and Konso vernacular building experts, there are some reasons found to be pushing factors for transformation of Konso vernacular houses.

Population growth and Land scarcity

Both population growth and land scarcity are interconnected with each other. The Konso community considers getting more than four children as a culture. The population growth caused land scarcity and most of the farm lands are changed to residential compound pushing the Konso vernacular housing units are to make some kind of transformation.

As to Ato Lemita, from Fasha, say formerly, konso was not densely populated. It had several hillside farming lands. Lemita described that the konso villages are formed in fortified village formation. These compacted walled village formation exposed for transmitted disease and

like Fasha the majority of walled villages are far from the zonal town and transportation problem exposed for lack of health care a lot of kids to death. Because of these reasons, the konso societies developed giving more birth to get a lot of kids in one family. That contributed to the population growth. These exposed for shortage of the farming land.

Urbanization

As to Kalla Gezahan's description, one of the reasons for transformation is urbanization. Because of urbanization especially a number of stone walled villages *(Palettas)* are located near zonal town exposed for transformation and the dwellers built several housing units built in their Kantas.

Ato Denfo, from Fasha add the modernity living condition mostly come from market places and the young konso inhabitants came from outside konso and they implement as they shown from other developing areas like Qoeqoro house built in their residential compound.

Ato Dirro, from Gaho some of the Gaho young Konso duelers came from Adolla (the traditional Gold mining) place colectind good mony and they build Qorqoro house for their family and for them.

Shortage of local building materials

Grass, Stone, Wood and *Algeta* (flexible natural rope) are the most essential building materials for construction of konso vernacular houses. Most of the konso hills are changed to farming lands due to population growth. These lead the land scarcity was develop in every Kons area. Because of the scarcity of land local building materials uses for several housing elements are exposed for shortage; especially the wood & grass became very expensive as there was no usable land to grow according to the demand of the vernacular housing construction. And, that arose need to search for other opportunity to build houses interims of building construction cost and building material.

Ato Denfo from Fasha explained the causes of transformation. Except stone most of local building materials are high in price. The Konso population is gowning and the new Konso vernacular houses are being built and older ones are being maintained their house. For new and old houses, are needed all kinds of local bulling materials. The Grass is very important for maintained the old thatched roof and thatched wall surfaces of Konso vernacular houses. That is why the causes that raise the price of grass. Due to scarcity of grass land grass isn't basically sufficient for both the new and maintained the old Konso vernacular houses.

Ato Dirro, from Gaho describing the causes to transform Konso vernacular houses, increases lodge construction in the zonal town of Konso. The lodges are built with local building materials like stone for masonry wall surfaces, mixed mud with straw for wooden wall surface, wood for columns *(Tudata)* and roof members and Grass for thatched roofing in high thickness. The lodge construction projects are collecting the local building materials from the farmers with attractive price. Then; the Konso people face great shortage of grass and wood and if the materials are available the cost is very expensive. Because of these reason the Konso people are pushed to select modern building materials and transformed their vernacular houses.

Termite attack

Describing the reason for transformation of konso vernacular houses like *Paffta* and *Manna*, Ato Zenebe said specially *Mana* is exposed for termite because of its construction system of thatched wall surfaces built from ground up to the end of the roof and the *Paffta* housing unit roof surface is constructed from ground surface up to the end of the roof Because of this construction system, the wall surface is exposed to termite attack. So, that increases the need for transformation.

Italian Invasion

As to Ato Robbo and Ato Gelabo, the nature of the original *Paffta* housing form was closed all round thatched roof surface that would lie on the ground having only one small open gate *(Harra)* and functionaly all *Pafftas* are used for as a command post for every *Kanta* to keep their walled villages from external forces, wild animals and fire by their unmarried young Konso people spent their night time in the upper floor *(Affda)* of *Paffta*. As to both of them, during the Italian invasion, the Italians attacked *Pafftas* and took all the young Konso people for their hard work. All most all of the new *Pafftas* were constructed after the invasion, transformed by reducing their thatched roof slopes length and creates raised floor surface. The transformed *Pafftas* became open in all round circular space helps the Konso people watch everything from outstrip.

The major and the sub- detail filters are shown as follows:-

- **Reason for transformation of Konso vernacular houses.**

  Land scarcity and Population growth.

  Urbanization.

  Shortage of local building materials.

  Termite attack.

  Italian Invasion.

  Lodge construction

Influencing reasons	Konso vernacular housing character	Remark
Population growth and Land scarcity	Manna, Kossa and Alita Kossa	
Urbanization	Paffta, Manna and Kossa	
Shortage of local building material	Manna and Kossa	
Termite attack	Paffta and Manna	
Italian invasion	Paffta	

Table 5.15 The influencing reasons for the transformation of konso vernacular houseing units and it presenting the analysis of the Konso vernacular houses transformed by several influencing reasons.

5.17.OBSERVATION

I was observed, all of the reason of transformation were happened in these two walled villages; specially the *Manna* housing unit is transformed to *Elphign* and the *Paffta* sloppy thatched roof surfaces reducing their length and creates additional raised floor levels under the shade of *Paffta* thatched roof. The *Kimbilita* (Stone housing) unites were constructed more in number in the time of invention specially *Kimbilita Kossa (Roqa)* was constructed a lot of housing unit in every Konso inhabitance of residential compound *(Tikka)* of both fortified village to uses as a hidden housing unit for unmarred young Konso peoples on the time of invasion.

5.18.THE TRANSFORMATION PROCESS OF KONSO VERNACULAR HOUSES.

Partial / Hybrid Transformation

By means of the focus group data collection tools presetting by Konso elders and Konso vernacular housing experts, there are some transformation process of Konso vernacular houses.

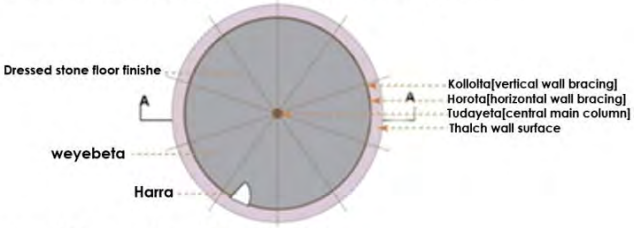
Describing about how the, As to Kalla Gezagn and Ato Lemita said the konso society transformed their houses on physical and spatial way. Both of them said some of the konso vernacular houses are transformed in form and spaces but Ato Lemita add the transformed housing units were respects the norms of the Konso people as to him, he said the partially transformed *Manna* hosing character to *Elphgn*. He raised two reasons the thatched wall surfaces is constructed from ground to the top of the roof edge needs more grass. Because of these the grass is very expensive to build Manna and the thatched roof surface of Manna is exposed for termite. Because of this, the thatched roof of *Manna* was constructed by mix mud with straw plastered the wooden wall and finishing by Cow dung having minimum height of 1.4 m. This type of partial transformation creates vertical building wall form and creates internal special architectural space.

According to Ato Denote Kusia and Ato Dirro raised the other type of partially transformed communal housing unit is *Paffta.* This type of house unit sloppy thatched roof cover is in the beginning constructed from the top of the roof to the ground level. The partially transformed *Paffta* has reduced sloppy thatched roof surface and wooden structure creates an open space between roof edge and ground level have 1.35m height an average and creates additional raised floor surface. The transformation mainly meeting point on the form of the *Paffta* vernacular house and the transformation is acknowledged by the people. According to Ato Zenebe there is no hybrid transformation in Fasha and Gaho but Ato Gelebo from Gaho support Ato Otoma's idea raised hybrid transformed housing unit was done in Durayete walled village done by young Durayete dwellers constructed the communal housing unit called Ceminto *Paffta* or Ceminto *Morra.* The proves *Paffta* is built at the ground open shaded surface with dry masonry wall and its floor surface is finished with flat smooth stone type. But, the hybrid transformed *Paffta* is constructed the floor finish with cement screed and the stone masonry wall bond with cement mortar and plastered with sand and cement. This type of hybrid transformation is supporting by young societies and totally rejected by the elders Konso dwellers; the hybrid transformed *Paffta* was built only in Durayete walled village; there is no other walled villages are tray to construct the Ceminto *Paffta* or Ceminto *Morra.*

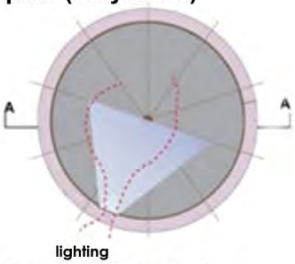
PARTIAL TRANSFORMATION *MANNA* TO *ELPGIGN*

BEFORE

Untransformed original Manna housing unit



Ground floor plan (Weyebeta)



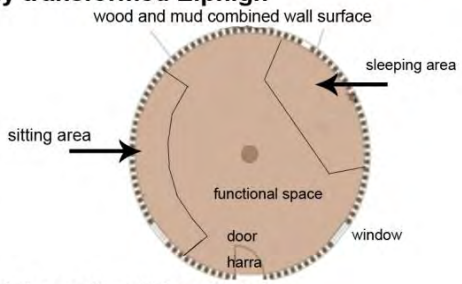
Lighting and Pathway in Weyebeta

Sectional view of Manna

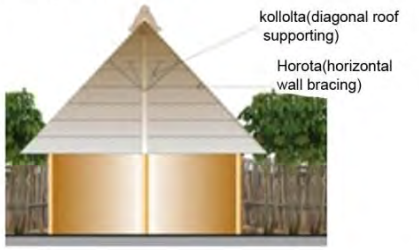
Elevation of Manna

AFTER

Partially transformed Elphigh



Ground floor plan (Weyebeta)



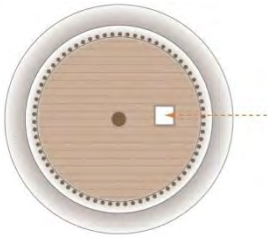
Section of Elphigh

Elevation of Elphigh

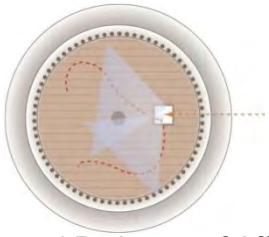
Figure 5.34 the graphical and sketch map of the partially transformed Manna to Elphig and it show us the analysis of partially transformed *Manna* to *Elfennotta (Elphign*) with its floor plans, elevations, and sections.

HYBRID TRANSFORMATION *ALITA* KOSSA

BEFORE



Raised floor Plan (Affda) of *Alita Kossa*



Lighting and Path way of Affda at Alita kossa

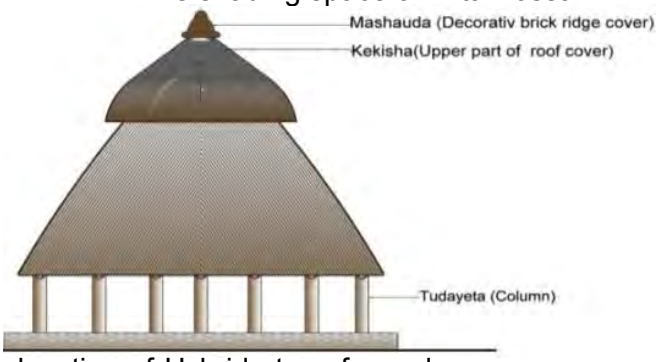
Sectional view of Alita Kossa

Typical elevation of Alita Kossa

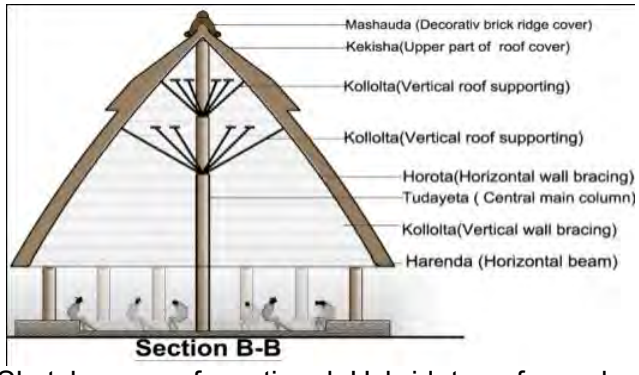
The shading space of Alita Kossa

AFTER

Ground floor plan (Weybeta)



Typical elevation of Hybride transformed



Sketch map of sectional Hybrid transformed Alita koss and the internal shading pictorial

Figure 5.35 The graphical presentation of untransformed Alita Kossa and the Hybrid transforme shading house (*Alita Kossa*) and it shows us the graphical analysis of untransformed Alita kosa sketch maps, photo and the present hybrid transformed shading house *(Alita Kossa)* photo presentation shows the masonry wall, mass concrete flooring with

Total Transformation

The totally transformed konso vernacular houses are located in all of the konso walled villages; with fabricated building material, form and some of these are in functional usage also These types of houses, as Kalla Gezagn and the respected elders and housing expertise describes, the totally transformed house roof surfaces constructed by corrugated iron sheet roof cover the wall and roof structure is made with wood, wall surfaces are plastered with mix mud with straw and the floor finished was doing Cow dung and some of them are used painting. And, the circular Konso vernacular housing units are changed to rectangular in form. This type of total transformation is not accepted by Konso people. But, because of urbanization, increase in the expense of local building materials and shortage of Konso vernacular housing experts, the transformation is still going on.

Ato Zenebe and Ato Denfo from Fasha raised new idea and added the totally transformed Qorkoro *Paffta (Morra)* was not constructed in Fasha because the totally transformed Qoroqro *Paffta* is not respecting the konso culture and norms even functionally the totally transformed Qorqoro *Paffta* housing unit is not served like other pervious *Pafftas.* This type of total transformation done on *Paffta* never keeps the value and culture of the Konso.

Ato Gelebo, Ato Lemita, Ato Dirro, Ato Denfo, and Ato Zenebe from Fasha and Gaho are the focuses group discussion participants, said the Konso vernacular houses are totally transformed in different ways because of shortage of building materials, expensive the vernacular housing construction, and respecting of sense of modernism is pushing the konso peoples doing the totally transformed rectangular Qorqoro houses in their residential compound. The totally transformed Qorqoro houses are built in the form of one floor level and two floors according to the sloppy compound spaces. The totally transformed Qorqoro residential houses have the semi basement floor functions as a shading space of cattle, storage place for grain, and farming materials. The ground floor functions as a sleeping room for wife and husband and one bed room for young children. It also has small living / waiting space. According to him, the newly transformed house is built in the lower level of his compound *(Arahata).*

Kalla Gezaghn talked about how Konso community transforms their houses, several ways. The first one is the total transformation of Konso vernacular houses done by using modern or fabricated building material like Qorqoro (it got its name get from its roof surface which is constructed with corrugated iron sheet root cover), hollow concrete block work and rectangular in building forms. The partially transformed Konso vernacular houses built with

local building materials and the hybrid transformation is using modern and local building material both in one for one building.

TOTALLY TRANSFORMED *MANNA* TO QORQORO HOUSE

BEFORE **AFTER**

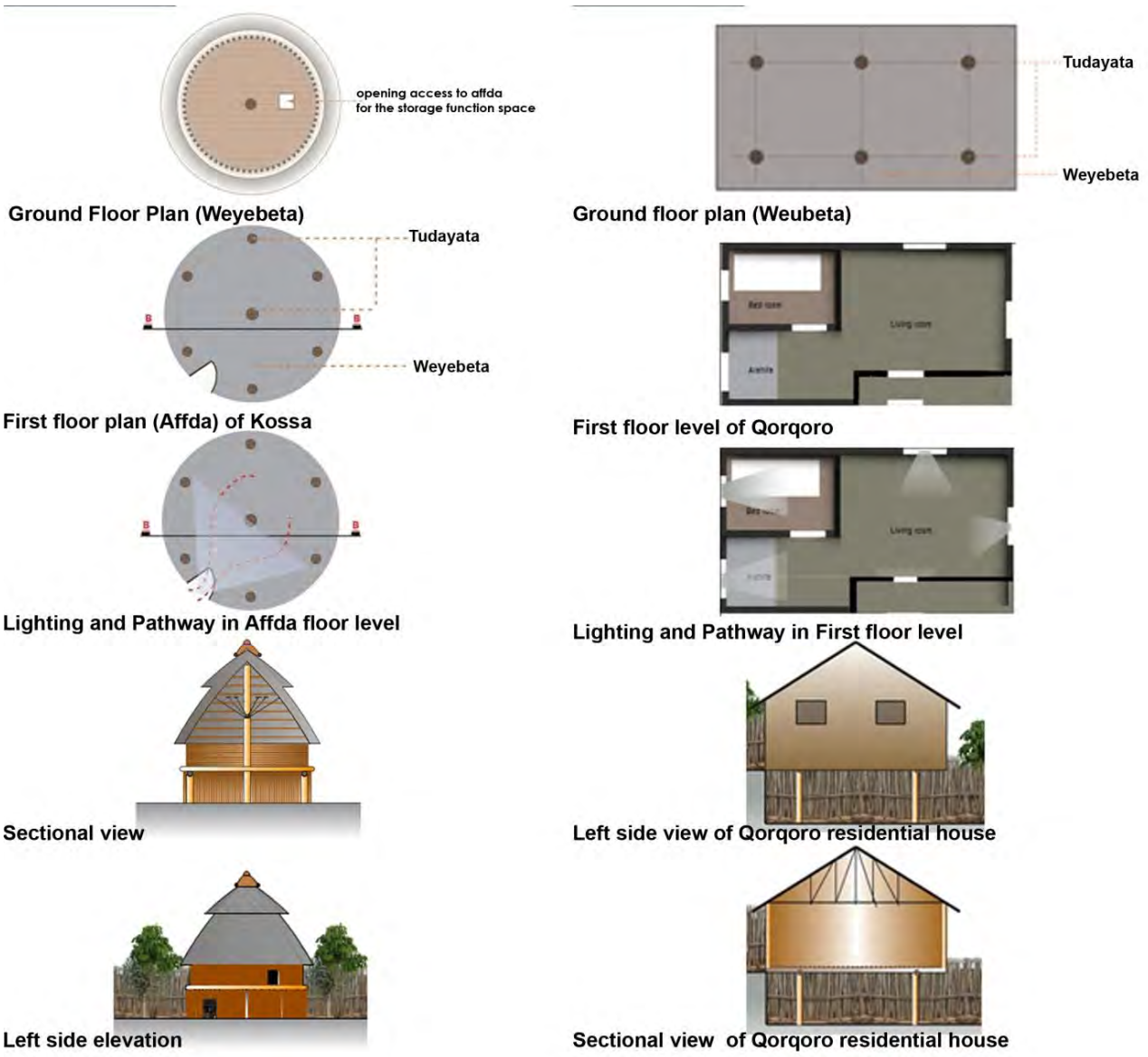


Figure 5.36 the graphical analysis presentation of untransformed original *Manna* and totally transformed Qorqoro residential house and it shows us the graphical analysis of original Manna sketch maps, photo and the totally transformed residential Qorqoro house. Both mapping presentation have their own floor plans, elevations and sectional views.

The major and the sub- detail filters are shown as follows:-

- **The transformation process of Konso vernacular houses.**

  Partial / Hybrid Transformation.

  Total Transformation.

  Normative Transformation

Function	Manna	Elfennotta (Elphign)	Remark
Maternity	Yes	No	At the delivery time the mother will go to her nearest Manna house.
Cheka (Local beer) preparation	Yes	No	Chack preparation was done under Reqa
Children sleeping	Yes	Yes	
Husband & wife sleeping	Yes	Yes	
Resting place of head of the house and his friend's	Yes	No	Resting place was changed to under the shade of Reqa

Table 5.16 Partially transformed *Manna* to *Elfennotta (Elphign)* based on function and it Show the Analysis of Partially transformed *Manna* to *Elfennotta (Elphign)* based on function.

Building components	Building materials					Remark
	Grass (Thatched)	Wood pine	Stone	Cement and sand plastering	Cement screed	
Roof surface	Yes	-	-	-	-	
Columns	-	Yes	-	-	-	
Roofing beams	-	Yes	-	-	-	
Masonry wall	-	-	Yes	yes	yes	
Floor finish	-	-	-	-	yes	

Table 5.17 the hybrid transformed of Alita konso vernacular houses and it shows us the Analysis of hybrid transformed *Alita koss* based on building material implemented on the masonary wall and floor building elementst.

Building components	Building materials						Rectangular form	Remark
	CIS	Circular wood	Wood pine	Dersed Stone finish	Mud finish	Timber finish		
Roof surface	yes	-	-	-	-	-	Yes	
Columns	-	Yes	-	-	-	-	-	
Roofing beams	-	Yes	-	-	-	-	-	
Wall surface	-	Yes	yes	-	Yes	-	yes	
Floor surface	-		-	Yes	-	yes	yes	
Door	yes	-	-	-	-	yes	yes	
Window	yes	-	-	-	-	yes	yes	
Roof surface	yes	-	-	-	-	-	yes	

Table 5.18 the totally transformed of *Manna* to Qorqoro house and it shows the Analysis of totally transformed *Manna* to Qorqoro residential housing unit on building material and building form implemented on several parts of the building elements.

Normative Transformation

Ato Denote Kusia presented about the symbolic meaning of the houses like *Kekishna* and *Mashawalda. Kekisha* is the upper roof part of the Konso vernacular houses stepped up on a lower roof surface with 50cm thickness at an average. It has a slopping length of 1.4m. *Kekisha* is usually found on konso vernacular houses like *Manna, Kossa*, *Reka* as a sign where all of the first sons of the Konso society reside. It is also located in all Konso clan leader residential compounds *(Tujja)* and *Paffta* - the community house located in an open communal space called *Morra*. Therefore, *Kakisha* has two special meanings for the community- the sign of a house of first sons and clan leaders. *Kekesha* is used as food for cattle for Konso society in the case of lasting dry seasons. In the dry seasons, it is not easy to get grass. Due to this, the society uses *kakisha* thatched roof as food for their cattle. Because of this, almost all of the konso community built his house with *kekisha* thatched roof; which is originally built as a sign only for elder sons and clan leaders. So, at present time, it becomes difficult to understand which ones are residential of elder sons or the clan leaders. This type of normative transformation is accepted by the society. Ato Robo, talking about the symbolic meanings of Konso vernacular houses, took *Mashawada* and *Kelasha* as example. He said *Mashawada* is made from burned break in a form of a pot and crowned at

the top edge of a communal house called *Paffta.* And, it is put on every Konso vernacular houses located in the *Poqula's* (clan leader) homestead.

Mashawada in Konso society has big meaning and place. At the top of the *Mashawada* is put an ostrich egg which signifies the compound is owned by *Poqula* and traditional king of Kenos (*Tikka).* If there is *Mashawada* at the top of *Paffta*, it means the house symbolizes it is respected communal house which serves the community. *Paffta* with its *Mashawada* is built by the whole community being leading by the elders and the Konso housing expertise.
Most of the Konso vernacular houses have *Mashawada* but these *Mashawada* is made from old pot that do not have crown slope. Some of Konso homesteads have *Mashawada* made with old iron bowls. Ato Robo, describing the symbolic meanings are being, said transformed symbolic have created their own norm and a different meanings. Explaining the traditional norm related to *Mashawada,* he raised the following:

If there is Konso vernacular house, it means there is a person; if there is *Mashawada* on traditional house, there is fire in the house and if there is fire that means there is food.

Housing character	Type of the transformation				Remark
	Partially transformed	Totally transformed	Hybrid transformed	Normatively transformed	
Elphign	Accepted	-	-	Partially Accepted	
Qorqoro Paffta	-	Totally rejected	-	Totally Rejected	Used as storage functionally
Qorqoro residence house	-	Accepted by some young Konso people	-	Totally rejected	Acceptance is based on its several function
Ceminto Paffta, Ceminto Morra	Partially Accepted (By young Konso people)		Partially Accepted (By young Konso people)	Rejected by Elders	

Table 5.19 the level of acceptance of the normatively transformed konso vernacular housing units and it describe the analysis of the level of acceptance the normatively transformed konso vernacular housing units.

5.19.CONSQUANCE OF THE TRANSFORMATION

Explaining about the future impacts of transformation on the community, the konso elders, housing expertise and Kalla Gezagn interpreted it in terms of cultural value, social needs, and economy. And, they are presented categorized in to negative and positive consequence.

Negative consequence

Lack of Cultural Value

Ato Denote Kusia, from Durayte and a tourism expert, has deep knowledge of Konso society. He said the transformed houses are several types some of which are *Paffta* and *Manna.*

The totally transformed houses don't respect cultural values and social needs. The corrugated iron sheet roof covered houses, for instance, don't show the cultural value of the Konso people because they miss originality of the Konso vernacular houses.

Kalla Gezaghn said the transformed Qorqoro *Mora (Paffta)* does not have *Mashawada* and *Kekisha* on their roof top like that of the Konso vernacular houses. So, they luck capacity to convey the symbolic meaning that *Mashawada* has. He resumed explaining that the *Tikka* (residential compound) misses *Kekisha* and an ostrich egg on its top which signifies the house is the house of clean or traditional king of Konso.

Ato Otoma also remarked some Konso people use *Mashawada* on their newly transformed houses as an esthetic value and that blurred the meaning the society has for *Mashawada*. Some of Konso vernacular houses have their own symbolic meanings for Konso people. However, these meanings are being changed as to him.

Social Needs

Regarding the social need, some of konso vernacular houses fulfill social needs of the society. But, the transformed houses are constructed without fulfilling these needs and the Konso people don't like them. As to Ato Robo's explanation, the totally transformed Konso vernacular houses particularly *Paffta* which is found in Durayite village has not respected the tradition of the Konso elders. The elders could not pass verdict in *Paffta* and the young Konso people could not stay night in it for their common post. This was because it was

formed in closed wall surface and corrugated iron sheet roof cover which released much heat during dry and hot climate. The *Qorqoro Paffta* also did not have a sitting place for elders from which they are supposed to watch their walled village.

Economic Cost

In terms of economy, the totally transformed houses with its building material, form and space are economical to construct; cheaper than the konso vernacular houses but do not tend to last long. They always need maintenance. And, that is expensive to handle the maintenance as they do not have expertise knowledge.

According to Ato Otoma Kudada, the house, especially the roof cover of totally transformed house needed maintenance within 5-7 years. The maintenance cost has become higher even for the houses that have been transformed in recent days. He added that Qorqoro houses have not fulfilled the culture, values and social needs of the Konso people.

Ato Gellebo Kemnere, the Konso housing expert said, on his part explained that the Konso housing experts and their supporters lost their job of building vernacular houses as the transformed ones are built in a short time interval.

consequence	Transformation type	Transformed Konso vernacular houses	Negative impacts	Remark
Luck of cultural value	Total transformation	Qorqoro Paffta, Qorqoro residential house	Because of luck of Kekisha and Mashawada	Regected by the socity
Social need	Hybrid transformation	Ceminto Paffta	Reduce the social need by Konso elders	
Economic cost	Total transformation	Qorqoro residential houses	Expensive in maintenance cost and labor cost of the experts	Deficalt to handiling the mentenance

Table 5.20 the negative consequence of the transformed konso vernacular houses and it show us the analysis of the negative consequence of the transformed konso vernacular houses.

Positive consequence

The transformed Konso vernacular houses do have positive and negative impacts on the community as to the data gathered from the target group. Ato Denote transformed his vernacular houses being influenced by building types at his work place and in the zonal city, Karat. Concerning its positive impact, he said it was very cheap to build new house than maintaining the old ones when he built his house Qorqoro 35 years before and they take it as a sign of development. Ato Otoma Kudada, the housing expert of Konso vernacular houses, said the community accepted and adapted the partially transformed houses which are built by cement and sand mortar. He added that they build several *Pafftas* by the cost of maintaining the old Konso vernacular houses.

consequence	Transformation type	Transformed Konso vernacular houses	Positive impacts	Remark
Luck of cultural value	Total transformation	Qorqoro Paffta, Qorqoro residential house	None	None
Social need	Hybrid transformation	Alita Kossa	Keeping the social intarest and built Hybrid alita Kossa	A few hay income Konso inhabitant are intersted
Economic cost	Total transformation	Qorqoro residential houses	Chiper in price for built the new housing unit.	The transformation in on going on

Table 5.21 the positive consequence of the transformed konso vernacular houses and it show us the analysis of the positive consequence of the transformed konso vernacular houses

Description	Force full consequence of transformation	Remark
Form	Total change from conical thatched roof surface to rectangular corrugated iron sheet roof cover wall surface.	
Symbolic meaning	Totally missing the culture and norms of the community	By luck of Kekisha and Mashawada
Building material	Built with modern building material and mud	
Function	Has more functional spaces	
Building cost	Chipper than *Manna* and Kossa vernacular house	
Maintenance cost	Expensive	Minimum within five year needs maintenance
Building expert	It is not an easy to get experts	Far from the zonal town.

Table 5.22 Consequence on totally transformed Qorqoro residential housing character and it show us the force full consequence of transformation of Qorqoro residential housing character in both of the case study areas.

Description	Force full consequence of transformation	Remark
Space	Not functional	Qorqoro *Paffta* is not accepted by Konso people because of total loss of its function, form space utilization, and specially rejected the culture and norms of the Konso society
Form	Totally change from the circular thatched roof and form of the house to rectangular corrugated iron sheet roof cover and mixed wooden and mud wall surface	
Symbolic meaning	Totally missing	
Building material	Built with modern building material, wood and mud	
Function	Totally missing	
Building cost	Cheaper than the vernacular *Paffta*	

Table 5.23 Consequence on totally transformed Qorqoro *Paffta* and it show us the force full consequence of transformation of Qorqoro on Qorqoro *Paffta* in case I study areas.

5.20.OBSERVATION

I am observed the transformed Konso vernacular houses are located in the two case study areas. And I was notice how Konso community transforms their houses in several walled villages *(Palletas)*. Most of the transformed Konso vernacular houses are built in around the Karat town walled villages *(Palletas)*. I have noticed all of the transformation is located in case two study wall villages.

The totally transformed Konso vernacular houses except *Paffta* housing unit transformed with modern building material, form and space. The physically transformed Konso vernacular houses are built with modern building materials, the circular form of vernacular houses are transformed to rectangular form and incorporate the circular function spaces transformed to rectangular. This type of special transformation is more acceptable by Konso duelers, but the totally transformed houses have corrugated iron sheet roof cover don't accepted by konso inhabitants because of generating more heat in the time of hot season. The totally transformed Qorqoro houses construction expense is fewer themes the Vernacular houses but its maintenance cost is very expensive for Konso duelers.

The partial transformation of konso vernacular houses also built more in number in Fasha and Gaho walled village *(Palletas)*. All of the partially transformed vernacular housing units are keep the norms and cultural value, some of them are creates additional functional spaces and acknowledged by the Konso people.

The normative transformation is one of the transformation type located in Fasha and Gaho. Normative transformation is creating in some of the Konso vernacular housing units will be change some of the housing elements located on the vernacular houses. The major reason of the normative transformation is changing the housing elements like *Mashawads* and *Kekisha* are misplaced and constructed in the wrong place.

CHAPTER SIX

FINDINGS AND RECOMENDATION

CHAPTER SIX

MAJOR FINDINGS AND RECOMENDATION

6.1. MAJOR FINDINGS OF THE STUDY

6.2. ORIGINAL KONSO VERNACULAR HOUSES

As to the konso elders, most of the traditional villages (Palletas) are located at the hill side for three reasons: to prevent external forces, to safeguard themselves from out breaking flood and to protect themselves from diseases like yellow-fever. According to Ato Robo, one focus group discussants, there is an order in which houses are built: the upper part, which is people's residential place, is called Oyta and the lower part for keeping cattle and equipments is called Arhata.

According to Kalla Grezahan's description, Agita and Manna vernacular houses have similar architectural façade. Both of the Houses are constructed with thatched roof and wall surfaces, having one exit and entrance door. Agita and Manna are different in function and interior spaces. Manna has special architectural functional spaces located on the ground floor level. But, Agita has two floor levels with different special functions. Their spaces are located at ground floor level and on the upper floor level with different uses. The upper floor level is supported by four columns (Kebeya) and it creates a secret spatial functional space called Kudda. Because of the presence of Kudda, this type of konso vernacular house is called Agita. Ato Denote Kusia Shenkere, explaining about Agita, said it is constructed using wood as a traditional building material especially for columns, flooring beams, floor finish, roofing beams, and inclined supporting roof bracing materials. Grass is used for making the thatched wall surface and two types of roof surface: the upper surface of the roof (Kekisha) and the lower part of the roof surface (Kabema).

Ato Gelebo, an interviewee, said at first all Pafftas are built on an open communal public space called Morra. Describing about Morra, Ato Gelebo said they were mostly located in good strategic place to watch their enemy systematically. Each wall town (palleta) is built having an open space for annual events like their own New Year celebration and dancing. Paffta has two type of thatched roof style the upper part of the thatched roof cover is called kekisha and the

lower thatched roof cover is called kebema. Paffta also has roof edge cover producing with Bieck called Mashawada. kekisha & kebema built on konso vernacular house like communal house of konso called Paffta, several konso vernacular houses located in the clan leader of konso, and in the elder son of konso residential compound (Tikka).

Ato Denote, another interviewee, elaborated about Reka it has three special architectural spaces: the ground floor level is used as storage for farm products, Preparation of local beer (*Check*) and sleeping or sitting space for grandfather of the family. The upper floor level has two architectural spaces Tudata and Arahata. Tudata is used as a storage space of milk, boiled grain and a different snack a farmer eats after he was back from the farm land before dinner is served. The secrete storage space is located after Tudata is called Arhata.

Kimbilita (Stone Houses) are of two types. The first one is stone *Paffta* (*Kimbilita Paffta*) and the second is hidden stone house (*Kimbilita Kossa*). There are two types of Pafftas. The first one is constructed with thatched roofs and wooden local building material built on an open communal space called *Morra* in all of the konso Palletas. The other one is constructed with stone as building material which is stone Paffta. Ato Gelebo, describing about Kimbilita Kossa, said it is build in individual Tikka; built with local building material like supporting stone roofed by wood. Its walls are constructed by stones and the top roof is covered by loom clay soil rammed to the well.

Ato Lomita, discussing about Kossa has an elevated floor surface and thatched roof surface. It has wooden wall surface together with an open storage space for grain. Depending on owner's wealth, there may be two, three or more Kosas in a residential compound at the lower ground surface of Arahata. This type of Kossa is built in two ways. One is constructed with local building materials like wood, grass, and stone. This type of Kossa has elevated storage space and the lower ground floor space which is used as shelter for cattle. The other type of Kossa is constructed in a similar way to the first one having an elevated storage space but its lower ground surface is covered by circular wooden wall. Alita Kossa has thatched roof surface that lay on dry large perennial woody tree. Under Alita kossa constructed the dry masonry rounded wall surface with the height of 45-60 cm.

6.3. REASONS FOR TRANSFORMATION

Population growth and land scarcity-the population growth caused land scarcity and most of the farm lands are changed to residential compound forcing the vernacular housing characteristics to make some kind of transformation.

Urbanization-daily laborers and housing construction experts, as to Ato Denfo, dwell mostly in around market areas and that exposes them to modernity which caused competition among the neighborhoods and pushed them to build houses with corrugated iron sheet.

Scarcity of local building materials-most of the konso hills are changed to farming lands due to various reasons. That caused lack of local building materials; especially the wood & grass became very expensive as there was no reserved land on which they are grown. And, that arose need to look for other opportunity to build houses in less price. Lodge construction and its investment are very high in Konso. They contributed to scarcity of local building material in that they need grass and wood as their construction material. So, most of the Konso people sell their grass for these investments. Then, the Konso dwellers are forced to have their own grass with an expensive price. So, they are pushed to shift their direction to the use of modern building materials and hence transform their houses.

Termite attack-describing the reason for transformation of konso vernacular houses like Manna to Elfennotta (Elphign) , Ato Glebo said the thatched wall surface of Manna is exposed to termite attack. So, that necessitated the need for transformation. Additionally, the thatched roof surface of the original Paffta is constructed with grass starting from roof edge to ground surface. Because of its building form the Paffta is exposed to termites attack.

Italian Invasion- As to Ato Gelabo, during the Italian invention, the Italians attacked Pafftas and took all the young Konso people. After the invasion, these types of Pafftas were transformed by reducing their thatched roof slopes length and the gates became raised floor surface in a way they could see anyone at a distance.

6.4. TRANSFORMATION PROCESS OF KONSO VERNACULAR HOUSES

Partial / Hybrid Transformation- Kalla Gezagnd said some of the Konso vernacular houses are partially transformed in form and spaces but still the transformation respects the norms and culture of the society.

Total Transformation- some of the Konso vernacular houses are totally transformed; with building material, architectural space and form of the vernacular houses. These type of houses,

as kalla Gezagn described, are constructed with corrugated iron sheet roof cover house using wood Hollow concrete block wall & mud as building material for the wall and the circular vernacular housing characteristics are changed to rectangular in form. The total transformation takes place by replacing the vernacular ones by Qorqoro houses which are built in different homestead places majorly they are located in Arhata lower surface of the residential compound (Tikka).

Normative Transformation- Kekisha is the upper roof part of the Konso vernacular houses. It is usually found on Konso vernacular houses like Manna, Koss, Reka as a sign where all of the first sons and clan leaders of the Konso society reside. At present time, it becomes difficult to understand which ones are residential of elder sons or the clan leaders. Mashawada in Konso society has big meaning and place. If there is Mashawada at the top of Paffta, it means the house symbolizes it is respected communal house which serves the community. Ato Robo, describing the symbolic meanings, said the transformed Mashawadas have created their own different meanings.

6.5. CONSEQUENCE OF THE TRANSFORMATION

Lack of Cultural Value- As to Ato Denote Kusia, the totally transformed houses doesn't respect cultural values of the Konso people. Kalla Gezaghn, on his part, said the transformed Qorqora Mora (Paffta) do not have Mashawada and Kekisha on their top like that of the Konso vernacular houses. They also miss an ostrich egg on its top which signifies the house is the house of clean or traditional king of Konso.

Social Needs- the transformed houses are constructed without fulfilling these needs and the Konso people don't like them. As to Ato Robo's explanation, the totally transformed Konso vernacular houses particularly Paffta has not respected the tradition of the Konso elders. The elders could not pass verdict in Paffta and the young Konso people could not stay the night in it for their command post.

Economic Cost- In terms of economy, the totally transformed houses with its building material, form and space are economical to construct; cheaper than the Konso vernacular houses. But, they do not tend to last long. They always need maintenance. And, that is expensive to handle the maintenance as they do not have expertise knowledge.

6.6. RECOMMENDATION

The proposed recommendation targets in the first place on the reasons for transformation of Konso vernacular houses. One of the reasons is population growth. The Konso people believe to overcome death by delivering more children as some of newly born babes lose their life within three years due to lack of medical treatment. Additionally, almost most of Konso fortified villages are located far from the woreda city and they face shortage of transportation system to get medication.

This type of death can be controlled by developing good medication system and assuring provision of the necessary resources. And, it is important to create awareness on methods of birth controlling to minimize the rate of the newly born babies. This will reduce population growth and hence land scarcity problem will be solved.

To alleviate the shortage of local building materials, it is again necessary to control population growth which will contribute to the availability of the building materials. It is also possible to preserve non owned communal grass land by collecting some portion of farming land from the Konso farmers and forest mountains with the help of the Konso clan leaders, elders, traditional religious leaders and tourism office. Interims of construction techniques, it is good to reduce the thickness of the Konso vernacular thatched roofs from 60-70cm to 25cm in depth. This type of construction method helps to reduce the quantity of grass used for roof cover and reduce the diameter of wood supporting the thatched roof surface and it's structural. This type of construction gives better solution to get non transformed Konso vernacular houses.

Termite attack problems can be solved in two ways. The first technique is taking an action with anti termite medication system and the second one is by developing alternative housing design solution. The design can be by raising the thatched roof structure from the ground level by using the local building material. Moreover, it is important to use local building materials like wood that wouldn't be attacked by termites for column and beam structure.

Regarding the negative consequence of the transformed Konso vernacular houses, loss cultural value and social needs is caused by totally and normatively transformed Konso vernacular houses when they are missing symbolic meanings of Masawada and Kekisha. So, it is necessary to use alternative design proposal like the one suggested by the study below. Considering the economical cost of the totally transformed Korkoro houses, they need maintenance within 5 years especially the corrugated iron sheet roof cover and labor costs. To minimize this problem, the study again recommends developing multi-function building; many in one building.

CHAPTER SEVEN

PROPOSAL DESIGN

CHAPTER SEVEN

PROPOSAL DESIGN

7.1 THE PROPOSED DESIGN CONCEPT

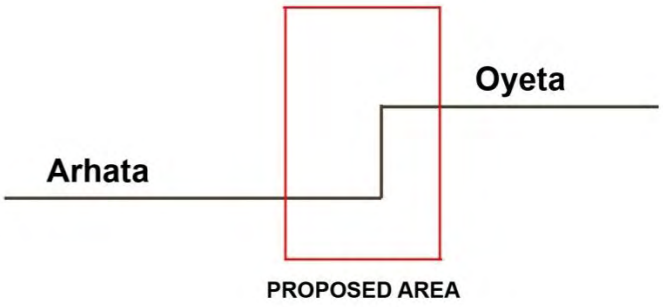
The design concept arises from raised floor concept of the Konso vernacular houses and their function. Most of the Konso vernacular houses have raised floor surfaces with several functions. Konso people build their vernacular houses in three ways; the first one is Communal building like Paffta, the second is residential vernacular houses like *Manna, Agita* and *Elphegen* and the last is functionally storage houses like *Kossa, Alita kossa, Reqa* and *Kimilita Kossa* (Stone house) uses for storage function. The proposed design also takes into account spatial function for sleeping, living, storage, open working spaces and shade of domestic animals. Openings are very important for cross ventilation system in hot climate season and the design proposal also encompasses this.

7.2 ARCHITECTURAL DESIGN PROPOSAL

The architectural design proposal is meant to recommend possible solutions concerning the pushing factors and the process of transforming Konso vernacular houses including the consquances that would follow. The design proposal is supposed to recommend how to minimize building material consumption, incorporate various housing functions in one building respecting the landscape and culture of the society and produce biogas for fire.

The architectural design proposal is basically meant to recommend one Konso vernacular building design which accommodates seven different Konso vernacular houses of their own functions in one building form. The proposed design also supposed to resolves the negative impacts that would be caused by the transformation of Konso Vernacular Houses.

PROPOSED DESIGN



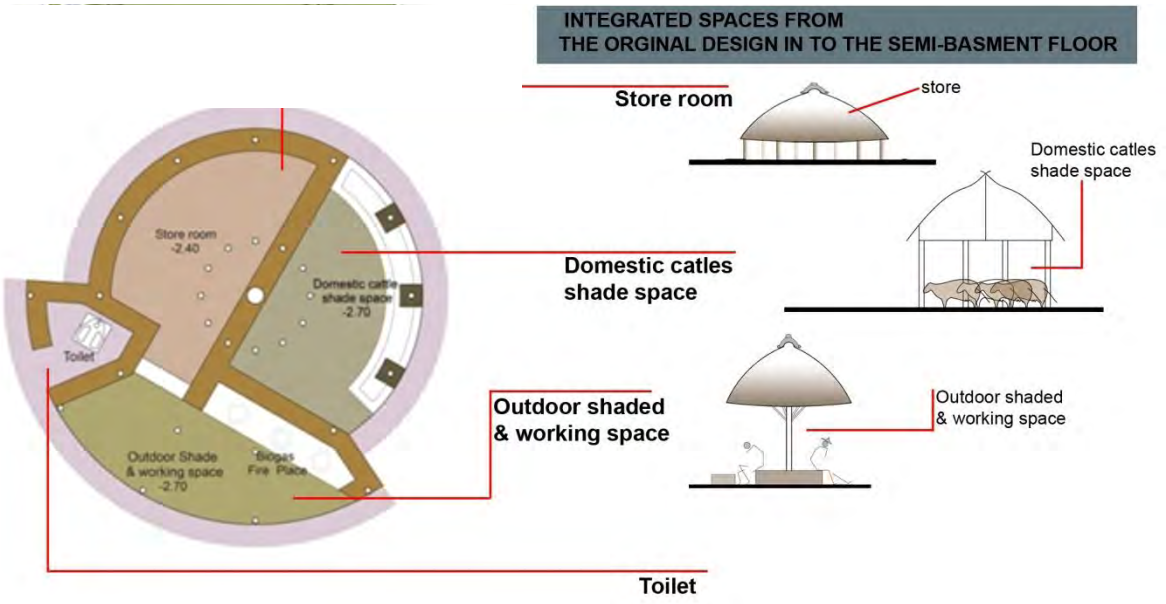
SITE PLAN

The Konso residential compounds are located at the hill sides and mountainous areas. All of them are parceled in two parts. The upper part of the compound is called *Oyeta* and the lower part of the compound is *Arahata.*

Oyeta is functionally uses for built the sleeping huts and in some parts storage functional huts are built. This type of thatched roof housing units are purposively construct in upper part of the compound *(Oyta)* because of to protect from attacking the thatched roof of housing units by the horn of the cattle. All of the *Oyetas* areas are lesser than *Arahatas.*

Arahata is serves as functional spaces for the residents, built the thatched roofing storage functional housing units, service functional houses and shade houses are built in this compound. The Konso people create the two special compounds according to the site condition it means respecting to the landscape. The Konso vernacular houses are built according to chronological order in the *Oyeta* and *Arahata.*

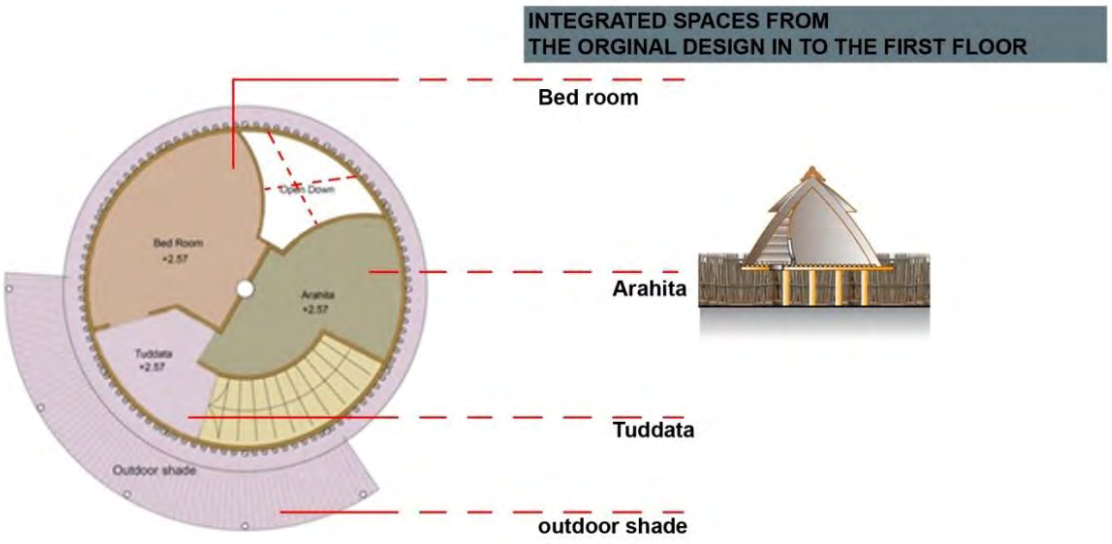
The main entrance and exit door *(Harra)* is located in the *Arahata* compound space. All most all of the residential compounds have fences in four sides, the dray stone fences have an average of 60cm.height and constructed without mortar. On the top of the dray stone fence the wooden fence constructed with the height of an average.



FLOOR PLAN AT ARHATA FLOOR LEVEL

The floor plan located at Arhata ground level design is basicaly born from the konso vernacular housing unites of service function buildings like Kossa, Alita kossa, Reqa and udda these vernacular housesare four in number having storage and kitchen function.

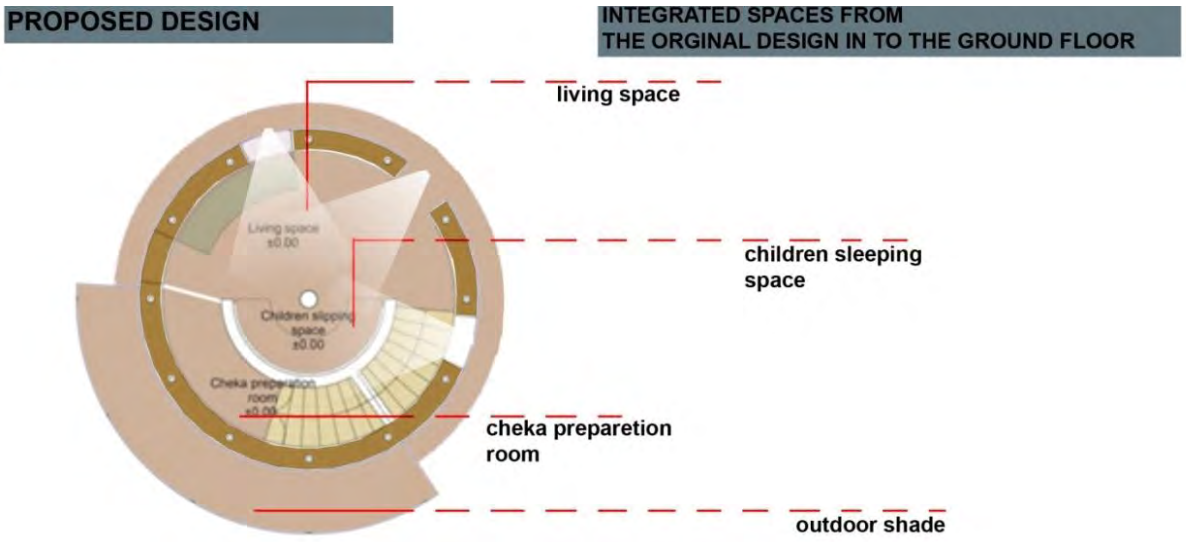
The new semi basement design is accommodate the above several function in one floor level.



FLOOR PLAN AT OYETA GROUND LEVEL

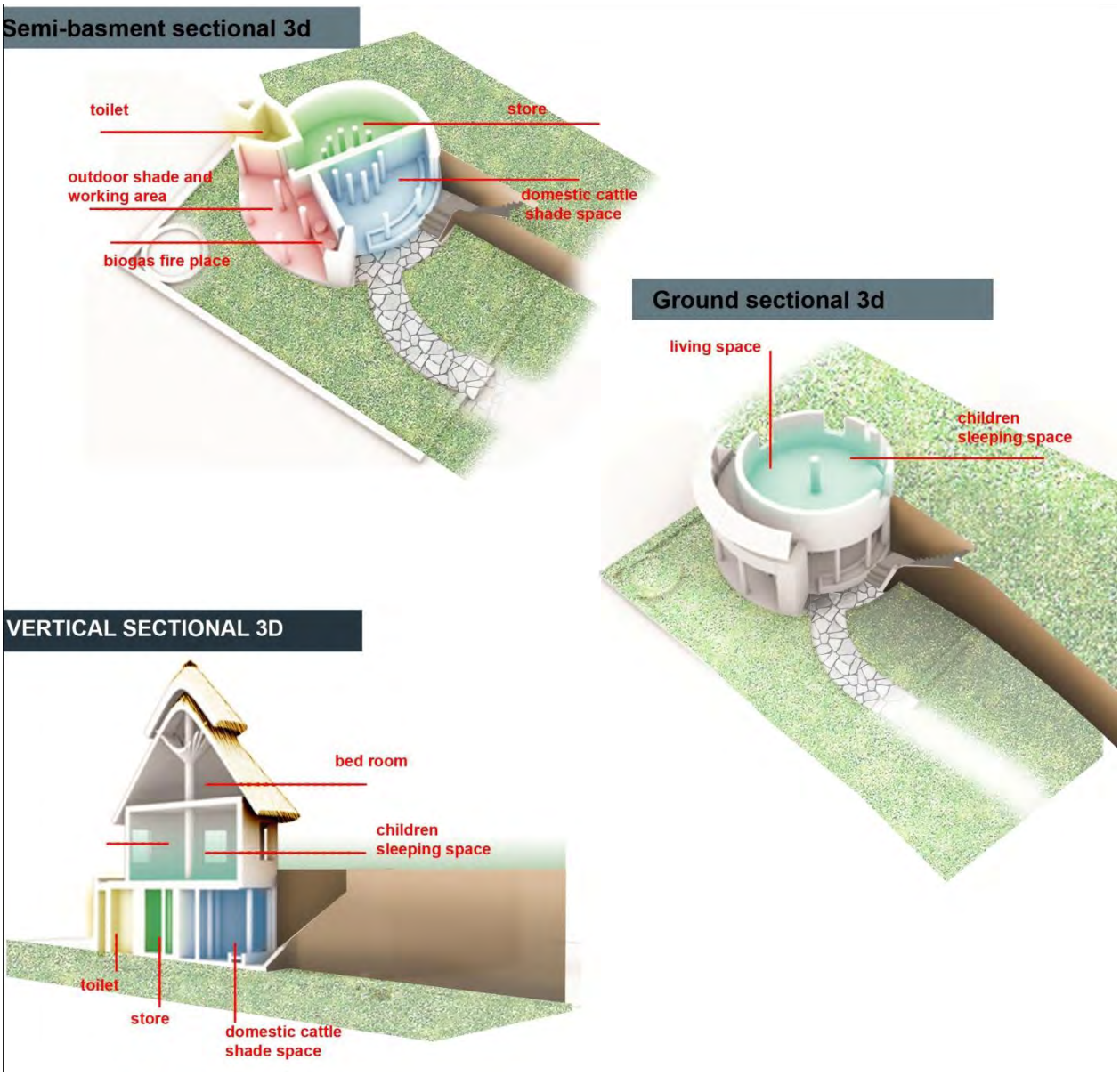
The Manna, Elphighn, Alita Kossa and Reqa Konso vernacular houses are the basic main usefull housing unites for the konso people by their functionl spaces.

The proposed floor plan design is accommodate the above konso housing function in one floor level by respecting of the Konso sloppy ladscape.



RAISED FLOOR PLAN

Manna, Elphign and Reqa Konso vernacular houses have majorly sleeping and secret storage functions at their ground and raised floor level functional spaces; the proposed floor plan basically designed for husband and wife sleeping spaces and the secrate storage function *(Arhata)* for the head of the house.



SECTIONAL 3D

The sectional 3D shows in details the functional several spaces of the semi basement floor, ground floor level and first floor levels several architectural spaces.

The three dimentional view of proposed design

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APPENDICES

List of interviews and the focus group desiccation members.

Ato Gelebo Bayeto is from in Gaho walled village. He is a strong farmer and housing expert in construction of stone houses in Gaho walled village.

Ato Lemita Kureba kiffo was born in Fasha. He is the best housing expert of all types of the Konso vernacular houses. He also has deep understanding of the vernacular houses and their meanings for the Konso people.

Kalla Gezaghn is one of the regional Poqullas(clan leader). His residential compound is located in Gamole. He is on the Poqullas family from Kantayata.

Ato Robo Guttna was born in Gamole and he is 80 years old. Robo is one of the much respected elder in Konso society. So, he is the first selected elder man in Gamole.

Ato Gelebo kumere Boyelle was born in Gamole walled town but he is living in Dokato. He is 68 Years old man and more respected elder is Dekato though his tribal root in Gamole.

Ato Dinote Kusia Senkere is 65 years old. Formerly, he was a teacher and now he is working in konso culture and tourism office. He is a respected elder in his walled village called Durayete and in the konso society.

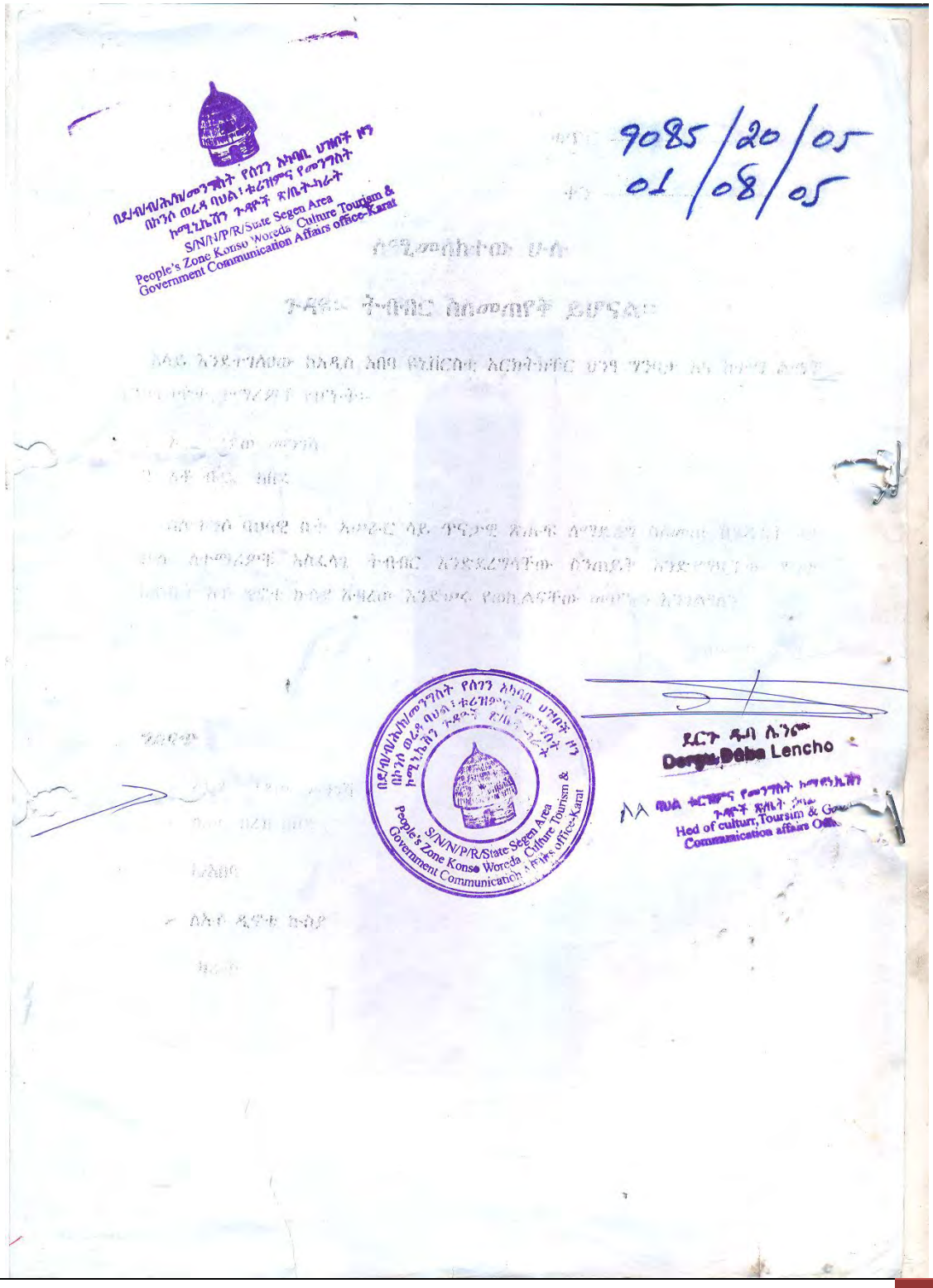
Ato Gelebo Beyene is from Fasha walled village. He is the housing expert of kimbilita Paffta and Kossa in his walled village.

Ato Kussia Beyene from fasha walled village. He is the respected elder in hie village.
Ato Otoma Kudado kedido from Gamole walled village. He is one of the best housing experts in Konso society and he has 65 years old.

Ato Gelebo Kessise has 65 years old elder in Gamole and the representative of Kalla gezaghn.

Ato Denfo Kinna from Gaho walled village. He is 70 years old elder In his walled village.
Ato Kedido Delebo is 67 years old and elder man from Dekato walled village.

SUPPORTING LETTER AND CENSUS RESULT



\Office Of Finance And Economic Dev't. *Population Size/1999EFY-2004EFY/* *4/12/2013*

KONSO WOREDA POPULATION SIZE /1999E.C-2003E.C/

POPULATION SIZE BY SEX ,KEBELE & AGELGLOT/CLUSTER/ BASED ON 1999E.C CENSUS RESULT

AGELGLOT	KEBELE	1999E.C				2000E.C				2001E.C				2002E.C				2003E.C			
		MALE	FEMALE	TOTAL	HH	MALE	FEMALE	TOTAL	HH	MALE	FEMALE	TOTAL	HH	MALE	FEMALE	TOTAL	HH	MALE	FEMALE	TOTAL	HH
FASHA	DEBANA	3,418	3,802	7,220	1,217	3,516	3,912	7,428	1,252	3,617	4,025	7,642	1,288	3,721	4,141	7,862	1,325	3,828	4,261	8,089	1,363
	DOHA	3139	3650	6,789	1,216	3,229	3,755	6,984	1,251	3,322	3,863	7,185	1,287	3,418	3,974	7,392	1,324	3,517	4,089	7,606	1,362
	FASHA	4,104	4,603	8,707	1,564	4,222	4,736	8,958	1,609	4,344	4,873	9,217	1,655	4,469	5,013	9,482	1,703	4,598	5,158	9,756	1,752
	GAHO	1,346	1,606	2,952	536	1,385	1,652	3,037	551	1,425	1,700	3,125	567	1,466	1,749	3,215	583	1,508	1,799	3,307	600
	GERA	1,707	1,856	3,563	612	1,756	1,910	3,666	630	1,807	1,965	3,772	648	1,859	2,022	3,881	667	1,913	2,080	3,993	686
	GESERGIO	2,563	2,838	5,401	1,020	2,637	2,920	5,557	1,049	2,713	3,004	5,717	1,079	2,791	3,091	5,882	1,110	2,872	3,180	6,052	1,142
	KA MALIE	4,163	4,702	8,865	1,653	4,283	4,837	9,120	1,701	4,406	4,976	9,382	1,750	4,533	5,120	9,653	1,800	4,664	5,268	9,932	1,852
	KASHALIE	2191	2598	4789	1,019	2,254	2,673	4,927	1,048	2,319	2,750	5,069	1,078	2,386	2,829	5,215	1,109	2,455	2,911	5,366	1,141
	MECHEKIE	1,467	1,548	3,015	580	1,509	1,593	3,102	597	1,553	1,639	3,192	614	1,598	1,686	3,284	632	1,644	1,735	3,379	650
	SAWGAMIE	1,570	1,900	3,470	675	1,615	1,955	13,570	694	1,662	2,011	3,673	714	1,710	2,069	3,779	735	1,759	2,129	3,888	756
	SUB TOTAL	25,668	29,103	54,771	10,092	26,407	29,943	56,350	10,382	27,168	30,806	57,974	10,680	27,951	31,694	59,645	10,988	28,758	32,610	61,368	11,304
KOLMIE	BORQARA	3,107	3,106	6,213	1,139	3,197	3,195	6,392	1,172	3,289	3,287	6,576	1,206	3,384	3,382	6,766	1,241	3,482	3,479	6,961	1,277
	GELGELE&QOLMA	5,080	5,436	10,516	1,818	5,226	5,593	10,819	1,870	5,377	5,754	11,131	1,924	5,532	5,920	11,452	1,979	5,691	6,091	11,782	2,036
	GUGNARA-KOLMIE	2,229	2,552	4,781	915	2,293	2,626	4,919	941	2,359	2,702	5,061	968	2,427	2,780	5,207	996	2,497	2,860	5,357	1,025
	MADERIA&GIZABA	4,526	4,941	9,467	1,747	4,656	5,083	9,739	1,797	4,790	5,229	10,019	1,849	4,928	5,380	10,308	1,902	5,070	5,535	10,605	1,957
	MASOYA	1,383	1,159	2,542	537	1,423	1,192	2,615	552	1,464	1,226	2,690	568	1,506	1,261	2,767	584	1,549	1,297	2,846	601
	TEBELA&QUCHALI	3,150	3,529	6,679	1,358	3,241	3,631	6,872	1,397	3,334	3,736	7,070	1,437	3,430	3,844	7,274	1,478	3,529	3,955	7,484	1,521
	SUB TOTAL	19,475	20,723	40,198	7,514	20,036	21,320	41,356	7,729	20,613	21,934	42,547	7,952	21,207	22,567	43,774	8,180	21,818	23,217	45,035	8,417
TURO	ARFAIDIE	1,719	1,859	3,578	671	1,769	1,912	3,681	690	1,820	1,967	3,787	710	1,872	2,024	3,896	730	1,926	2,082	4,008	751
	GELABO	2,658	3,043	5,701	1,098	2,735	3,131	5,866	1,130	2,814	3,221	6,035	1,163	2,895	3,314	6,209	1,197	2,978	3,410	6,388	1,231
	LEHAITIE	2,086	2,230	4,316	770	2,146	2,294	4,440	792	2,208	2,360	4,568	815	2,272	2,428	4,700	838	2,337	2,498	4,835	862
	TESHMALIE	2,225	2,412	4,637	909	2,289	2,481	4,770	935	2,355	2,553	4,908	962	2,423	2,626	5,049	990	2,493	2,702	5,195	1,018
	SUB TOTAL	8688	9544	18,232	3448	8,939	9,818	18,757	3,547	9,197	10,101	19,298	3,650	9,462	10,392	19,854	3,755	9,734	10,692	20,426	3,862
GUMAIDIE	ADDISGEBERIE	1,104	1,144	2,248	425	1,136	1,177	2,313	437	1,169	1,211	2,380	450	1,203	1,246	2,449	463	1,238	1,282	2,520	476
	AYLOTA DOKATU	2,554	2,738	5,292	1,012	2,628	2,817	5,445	1,041	2,704	2,898	5,602	1,071	2,782	2,982	5,764	1,102	2,862	3,068	5,930	1,134
	BECHO	872	918	1,790	343	897	944	1,841	353	923	971	1894	363	950	999	1949	373	977	1028	2005	384
	BIRBIRSA	2918	3029	5,947	1,035	3,002	3,116	6,118	1,065	3,088	3,206	6,294	1,096	3,177	3,298	6,475	1,128	3,269	3,393	6,662	1,160
	GARCHIE	620	652	1,272	243	638	671	1,309	250	656	691	1,347	257	675	710	1,385	264	694	730	1,424	271
	LULTU	3,089	3,144	6,233	1,133	3,178	3,234	6,412	1,166	3,270	3,327	6,597	1,360	3,364	3,423	6,787	1,399	3,461	3,522	6,983	1,439
	MELEGA-DEGAYA	1,176	1,051	2,227	396	1,210	1,081	2,291	407	1,245	1,112	2,357	419	1,281	1,144	2,425	431	1,318	1,177	2,495	443
	SEGEN GENNET	1,446	1,497	2,943	568	1,488	1,540	3,028	584	1,531	1,584	3,115	601	1,575	1,630	3,205	618	1,620	1,677	3,297	636
	SEGEN TOWN	1,834	1,793	3,627	834	1,887	1,845	3,732	858	1,941	1,898	3,839	883	1,897	1,953	3,950	908	2,055	2,009	4,064	934
	SUB TOTAL	15,613	15,966	31,579	5989	16,064	16,425	32,489	6,161	16,527	16,898	33,425	6,500	17,004	17,385	34,389	6,686	17,494	17,886	35,380	6,877
	ABAROBA	3,979	4,287	8,266	1,406	4,094	4,410	8,504	1,446	4,212	4,537	8,749	1,488	4,333	4,668	9,001	1,831	4,458	4,802	9,260	1,575

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S/N/N/P/R State Segen Area People's Zone Konso Woreda F/E/D/Office

Office Of Finance And Economic Dev't

Population Size/1999EFY-2004EFY/

4/12/2013

KARAT	BA-AIDIE	2,650	2,750	5,400	1,009	2,726	2,829	5,555	1,038	2,805	2,911	5,716	1,068	2,886	2,995	5,881	1,099	2,969	3,081	6,050	1,131
	BUSO	1,524	1,723	3,247	644	1,568	1,773	3,341	663	1,613	1,824	3,437	682	1,660	1,877	3,537	702	1,708	1,931	3,639	722
	DARA	1,716	1,814	3,530	663	1,765	1,866	3,631	682	1,816	1,920	3,736	702	1,868	1,975	3,843	722	1,922	2,032	3,954	743
	DOKATU	3,293	3,679	6,972	1,407	3,388	3,785	7,173	1,448	3,486	3,894	7,380	1,490	3,587	4,006	7,593	1,533	3,690	4,122	7,812	1,577
	DURAYTIE	2,014	2,181	4,195	912	2,072	2,244	4,316	938	2,132	2,309	4,441	965	2,193	2,376	4,569	993	2,256	2,445	4,701	1,021
	FUCHUCHA	649	655	1,304	314	668	674	1,342	323	687	693	1,380	332	707	713	1,420	342	727	734	1,461	352
	GAMOLIE	940	1,098	2,038	449	967	1,129	2,096	462	995	1,162	2,157	475	1,024	1,196	2,220	489	1,054	1,230	2,284	503
	GOCHA	1,253	1,387	2,640	475	1,289	1,427	2,716	489	1,326	1,468	2,794	503	1,364	1,510	2,874	518	1,403	1,554	2,957	533
	JARSO	5,670	5,947	11,617	2,175	5,833	6,118	11,951	2,238	6,001	6,294	12,295	2,302	6,174	6,475	12,649	2,368	6,352	6,662	13,014	2,436
	KARAT TOWN	3,164	2,624	5,788	1,689	3,255	2,699	5,954	1,738	3,349	2,777	6,126	1,788	3,446	2,857	6,303	1,840	3,545	2,939	6,484	1,893
	MECHELO	1,243	1,456	2,699	503	1,279	1,498	2,777	517	1,316	1,541	2,857	532	1,354	1,585	2,939	547	1,393	1,631	3,024	563
	NALAYA SEGEN	1801	1979	3,780	784	1,853	2,036	3,889	807	1,906	2,095	4,001	830	1,961	2,155	4,116	854	2,018	2,217	4,235	878
	SOROBO	2,435	2,754	5,189	977	2,505	2,833	5,338	1,005	2,577	2,915	5,492	1,034	2,651	2,999	5,650	1,064	2,727	3,086	5,813	1,094
	SUB TOTAL	32,331	34,334	66,665	13,407	33,282	35,321	68,583	13,794	34,221	36,340	70,561	14,191	35,208	37,387	72,595	14,602	36,222	38,466	74,688	15,021
REDA	GRAND TOTAL	101,775	109,670	211,446	40,450	104,708	112,827	217,535	41,613	107,726	116,079	223,805	42,973	110,832	119,425	230,257	44,211	114,026	122,871	236,897	45,481

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Page 1 of 2

KONSO WOREDA POPULATION SIZE/1999-2007E.C/

POPULATLON SIZE BY SEX,KEBELE & AGELGLOT BASED ON 1999E.C CENSUS RESULT

No	AGELGLOT	KEBELE	2004E.C				2005 E.C				2006 E.C				2007 E.C				2008 E.C			
			MALE	FEMALE	TOTAL	HH	MALE	FEMALE	TOTAL	HH	MALE	FEMALE	TOTAL	HH	MALE	FEMALE	TOTAL	HH	MALE	FEMALE	TOTAL	HH
		DEBANA	3,938	4,384	8,322	1,402	4,051	4,510	8,562	1,712	4,168	4,640	8,808	1,762	4,288	4,774	9,062	1,812	4,412	4,911	9,323	1,865
		DOHA	3,618	4,207	7,825	1,401	3,722	4,328	8,050	1,610	3,829	4,453	8,282	1,656	3,940	4,581	8,521	1,704	4,053	4,713	8,766	1,753
		FASHA	4,731	5,307	10,038	1,802	4,867	5,460	10,327	2,065	5,007	5,617	10,625	2,125	5,152	5,779	10,931	2,186	5,300	5,945	11,245	2,249
		GAHO	1,552	1,851	3,403	617	1,597	1,904	3,501	700	1,643	1,959	3,602	720	1,690	2,016	3,706	741	1,739	2,074	3,812	762
		GERA	1,968	2,140	4,108	706	2,025	2,202	4,226	845	2,083	2,265	4,348	870	2,143	2,330	4,473	895	2,205	2,397	4,602	920
		GESERGIO	2,955	3,272	6,227	1,175	3,040	3,366	6,406	1,281	3,128	3,463	6,591	1,318	3,218	3,563	6,781	1,356	3,310	3,666	6,976	1,395
		KA MALIE	4,799	5,420	10,219	1,905	4,937	5,576	10,513	2,103	5,079	5,737	10,816	2,163	5,226	5,902	11,128	2,226	5,376	6,072	11,448	2,290
		KASHALIE	2,526	2,995	5,521	1,174	2,599	3,081	5,680	1,136	2,674	3,170	5,844	1,169	2,751	3,261	6,012	1,202	2,830	3,355	6,185	1,237
		MECHEKIE	1,691	1,785	3,476	669	1,740	1,836	3,576	715	1,790	1,889	3,679	736	1,841	1,944	3,785	757	1,894	2,000	3,894	779
		SAWGAMIE	1,810	2,190	4,000	778	1,862	2,253	4,115	823	1,916	2,318	4,234	847	1,971	2,385	4,356	871	2,028	2,453	4,481	896
1	FASHA	SUB TOTAL	29,588	33,551	63,139	11,629	30,440	34,517	64,957	12,991	31,317	35,511	66,828	13,366	32,219	36,534	68,753	13,751	33,147	37,586	70,733	14,147
		BORQARA	3,582	3,579	7,161	1,314	3,685	3,682	7,367	1,473	3,791	3,788	7,579	1,516	3,900	3,897	7,798	1,560	4,013	4,009	8,022	1,604
		GELGELE&QOLMAI	5,855	6,267	12,122	2,095	6,024	6,447	12,471	2,494	6,197	6,633	12,830	2,566	6,376	6,824	13,200	2,640	6,559	7,021	13,580	2,716
		GUGNARA-KOLMIE	2,569	2,943	5,512	1,054	2,643	3,028	5,671	1,134	2,719	3,115	5,834	1,167	2,797	3,205	6,002	1,200	2,878	3,297	6,175	1,235
		MADERIA&GIZABA	5,216	5,695	10,911	2,013	5,366	5,859	11,225	2,245	5,521	6,028	11,549	2,310	5,680	6,201	11,881	2,376	5,843	6,380	12,223	2,445
		MASOYA	1,594	1,334	2,928	618	1,640	1,372	3,012	602	1,687	1,412	3,099	620	1,736	1,453	3,188	638	1,786	1,494	3,280	656
		TEBELA&QUCHALI	3,631	4,069	7,700	1,565	3,736	4,186	7,922	1,584	3,843	4,307	8,150	1,630	3,954	4,431	8,385	1,677	4,068	4,558	8,626	1,725
2	KOLMIE	SUB TOTAL	22,447	23,887	46,334	8,659	23,093	24,575	47,668	9,534	23,759	25,283	49,041	9,808	24,443	26,011	50,454	10,091	25,147	26,760	51,907	10,381
		ARFAIDIE	1,982	2,142	4,124	773	2,039	2,204	4,243	849	2,098	2,267	4,365	873	2,158	2,332	4,491	898	2,220	2,400	4,620	924
		GELABO	3,064	3,508	6,572	1,267	3,152	3,609	6,761	1,352	3,243	3,713	6,956	1,391	3,336	3,820	7,156	1,431	3,433	3,930	7,362	1,472
		LEHAITIE	2,404	2,570	4,974	887	2,473	2,644	5,117	1,023	2,544	2,720	5,265	1,053	2,618	2,799	5,416	1,083	2,693	2,879	5,572	1,114
		TESHMALIE	2,565	2,780	5,345	1,047	2,639	2,860	5,499	1,100	2,715	2,942	5,657	1,131	2,793	3,027	5,820	1,164	2,874	3,114	5,988	1,198
4	TURO	SUB TOTAL	10,015	11,000	21,015	3,974	10,303	11,317	21,620	4,324	10,600	11,643	22,243	4,449	10,905	11,978	22,883	4,577	11,220	12,323	23,543	4,709
		ADDISGEBERIE	1,274	1,319	2,593	490	1,311	1,357	2,668	534	1,348	1,396	2,745	549	1,387	1,436	2,824	565	1,427	1,478	2,905	581
		AYLOTA DOKATU	2,945	3,156	6,101	1,167	3,030	3,247	6,277	1,255	3,117	3,340	6,457	1,291	3,207	3,437	6,643	1,329	3,299	3,536	6,835	1,367
		BECHO	1,005	1,058	2,063	395	1,034	1,088	2,122	424	1,064	1,120	2,184	437	1,094	1,152	2,246	449	1,126	1,185	2,311	462
		BIRBIRSA	3,363	3,491	6,854	1,193	3,460	3,592	7,051	1,410	3,559	3,695	7,254	1,451	3,662	3,801	7,463	1,493	3,767	3,911	7,678	1,536
		GARCHIE	714	751	1,465	279	735	773	1,507	301	756	795	1,551	310	777	818	1,595	319	800	841	1,641	328
		LULTU	3,561	3,624	7,185	1,480	3,664	3,728	7,392	1,478	3,769	3,836	7,605	1,521	3,878	3,946	7,824	1,565	3,989	4,060	8,049	1,610
		MELEGA-DEGAYA	1,356	1,211	2,567	456	1,395	1,246	2,641	528	1,435	1,282	2,717	543	1,477	1,319	2,795	559	1,519	1,357	2,876	575
		SEGEN GENNET	1,667	1,725	3,392	654	1,715	1,775	3,490	698	1,764	1,826	3,590	718	1,815	1,878	3,694	739	1,868	1,932	3,800	760
		SEGEN TOWN	2,114	2,067	4,181	961	2,175	2,127	4,301	860	2,238	2,188	4,425	885	2,302	2,251	4,553	911	2,368	2,316	4,684	937
5	GUMAIDIE	SUB TOTAL	17,999	18,402	36,401	7,075	18,517	18,932	37,449	7,490	19,051	19,477	38,528	7,706	19,599	20,038	39,637	7,927	20,164	20,615	40,779	8,156
		ABAROBA	4,587	4,940	9,527	1,620	4,719	5,082	9,801	1,960	4,855	5,229	10,084	2,017	4,995	5,379	10,374	2,075	5,139	5,534	10,673	2,135
		BA-AIDIE	3,055	3,170	6,225	1,164	3,143	3,261	6,404	1,281	3,234	3,355	6,589	1,318	3,327	3,452	6,778	1,356	3,422	3,551	6,974	1,395
		BUSO	1,757	1,987	3,744	743	1,808	2,044	3,852	770	1,860	2,103	3,963	793	1,913	2,164	4,077	815	1,968	2,226	4,194	839
		DARA	1,977	2,091	4,068	764	2,034	2,151	4,185	837	2,093	2,213	4,306	861	2,153	2,277	4,430	886	2,215	2,342	4,557	911
		DOKATU	3,796	4,241	8,037	1,622	3,905	4,363	8,268	1,654	4,018	4,489	8,507	1,701	4,134	4,618	8,752	1,750	4,253	4,751	9,004	1,801
		DURAYTIE	2,321	2,516	4,837	1,050	2,388	2,588	4,976	995	2,457	2,663	5,120	1,024	2,527	2,740	5,267	1,053	2,600	2,819	5,419	1,084
		FUCHUCHA	748	755	1,503	362	770	777	1,546	309	792	799	1,591	318	815	822	1,637	327	838	846	1,684	337
		GAMOLIE	1,084	1,265	2,349	518	1,115	1,301	2,417	483	1,147	1,339	2,486	497	1,180	1,377	2,558	512	1,214	1,418	2,632	526
		GOCHA	1,443	1,599	3,042	548	1,485	1,645	3,130	626	1,527	1,692	3,220	644	1,571	1,741	3,312	662	1,617	1,791	3,408	682
		JARSO	6,535	6,854	13,389	2,506	6,723	7,051	13,775	2,755	6,917	7,254	14,171	2,834	7,116	7,463	14,579	2,916	7,321	7,678	14,999	3,000
		KARAT TOWN	3,647	3,024	6,671	1,948	3,752	3,111	6,863	1,373	3,860	3,201	7,067	1,412	3,971	3,293	7,264	1,453	4,086	3,388	7,473	1,495

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6	KARAT	MECHELO	1,433	1,678	3,111	579	1,474	1,726	3,201	640	1,517	1,776	3,293	659	1,560	1,827	3,388	678	1,605	1,880	3,485	697
		NALAYA SEGEN	2,076	2,281	4,357	903	2,136	2,347	4,482	896	2,197	2,414	4,612	922	2,261	2,484	4,744	949	2,326	2,555	4,881	976
		SOROBO	2,806	3,175	5,981	1,126	2,887	3,266	6,153	1,231	2,970	3,361	6,330	1,266	3,055	3,457	6,513	1,303	3,143	3,557	6,700	1,340
		SUB TOTAL	37,265	39,576	76,841	15,453	38,338	40,716	79,054	15,811	39,442	41,888	81,331	16,266	40,578	43,095	83,673	16,735	41,747	44,336	86,083	17,217
WOREDA GRAND TOTAL			117,314	126,416	243,730	48,790	120,693	130,057	250,750	50,150	124,169	133,803	257,971	51,594	127,745	137,658	265,403	53,080	131,424	141,621	273,045	54,609

POSTSCRIPT

Some comments were received from the external and internal examiners following the defense the thesis.

The examiners include their suggestion to add several elements around and inside the *Morra* (open communal space), the thesis need to review properly and some of the lettering sizes located in chapter five (Case study) are small in size on the several figures and drawings.

I was agreeing to revise the above valuable comments to make it according to both examiners and I was also discussing in some points with my thesis adviser to make it properly.

The thesis paper is done according to the above comments and I would like to tank external and internal examiners and my advisor for their valuable comments to help me making the thesis in good standard.