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TRANSFORMATION OF VERNACULAR HOUSE, COMPOUND AND SETTLEMENT OF *GURAGE*, ETHIOPIA

Yalew Seid

Advisors: Dr. Elias Yitbarek and Ato Yonas Alemayehu

In partial fulfilment of Master of science in Housing and Sustainable Development

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DECLARATION

I the undersigned, declare that this thesis is my original work and has not been presented for a degree in any other university and that all sources of reference materials used for this thesis have been dully acknowledged.

Name of Candidate : Yalew Seid

Signature:

Addis Ababa University School of Graduate Studies



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Ethiopian Institute of Architecture, Building Construction and City Development

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Yalew Seid

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Approved by Board of Examiners

1. Ass. Pro. Dr. Elias Yitbarek

Advisor

Signature

Date

2. Ato Yonas Alemayehu

Co-Advisor

Signature

Date

3. Ato Fasil Giorgis

External Examiner

Signature

Date

4. Ato Dawit Benti

Internal Examiner

Signature

Date

ABSTRACT

In this era of globalization, where mixity of cultural fabrics are increasing and where the advancement of technology is taking place, it becomes challenging to protect the vernacular house, compound and settlement(HCS) from influence. So there must be way of appropriating the influence and enhance the vernaculars in going along with the transformation. In order to achieve this, the research aimed to understand and record existing situation of the vernacular house compound and settlement of *Gurage* in terms of physical and spatial aspects; which then check and show the existence of transformation in reference with its original setting. It also investigates factors and actors of the transformation and evaluates it by checking criticality of factors and contextuality of solutions provided. After which it is summed up with recommendations. Detailed case study research method is employed in addition to qualitative and quantitative analytical methods to achieve the research's objectives.

After exploring, recording and analyzing existing situations of the *Gurage* vernacular house, compound and settlement(HCS) it proves that there exists transformation. The transformations found out based on this research are both externally and internally triggered which are named as exo-generic and endo-generic transformations respectively. In which governmental organizations, non-governmental organizations and the people themselves, directly or indirectly, play their role in the process. Appropriateness of the transformation is tested through criticality of factors, which causes the transformation, and contextuality of solutions. Based on this test some are critical and contextual, critical and non-contextual, non-critical and contextual and non-critical factors and non-contextual solution.

In the process of physical and spatial transformation it is found out that hidden or indirect factors also have great impact or contribution, like population growth and economic status. It is also found out that most transforming elements are adopted from a common rural town housing typology 'korkoro bet' to overcome challenges of the vernacular ones and/or other influences. This is an indicator showing demands for the provision of appropriate alternative design solutions to be adapted or implemented directly in the area.

This research also proves that transformation of vernacular house, compound and settlement(HCS) is inevitable. So, one possible option to keep and enhance the vernacular fabric is to guide the transformation in an appropriate way.

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LIST OF ACRONYMS

CSA. Central Statistics Agency.

EMA. Ethiopian Map Authority.

CIS. Corrugated Iron Sheet.

SNNP. Southern Nations, Nationalities and People.

SNNPRS. Southern Nations, Nationalities and People Regional State.

HCS. House unit, Compound and Settlement

NGO. Non Governmental Organization

IMPORTANT LOCAL GLOSSARIES

Afar, Somali, Tigre, Sidama, Dorze, Gurage, Conso, Oromo, Amhara....: Some of the ethnic groups in Ethiopia.

'korkoro bet' : A house covered with corrugated iron sheet.

Wereda: The fourth, from top to bottom, hierarchical administrative unit in Ethiopia.

Kebele / Got': The fifth/sixth, from top to bottom, hierarchical administrative units respectively in Ethiopia.

Berazshi, Borkema, Girardibir, Yeferezye and Yerezem: Names of Village Settlements in Case one.

Denka and E'guraguazer: Names of Village Settlements in Case two.

Senen (Gemeso): Name of Village Settlement in Case three.

Shanka (Wereped): Name of Village Settlement in Case Four.

Desene (Bideret and Kotchebitr): Name of Village Settlement in Case five.

Ginab (Dedegba): Name of Village Settlement in Case six.

Hawassa: Capital city of SNNPRS.

Oromiya: One of the nine regions in Ethiopia

Yem: Special Zone of SNNP.

Hadiya: One of the Zone in SNNPRS.

Silte: One of the Zone in SNNPRS.

Abeshge: One of the weredas in Gurage Zone.

Kebena: One of the weredas in Gurage Zone.

Kokir Gedebano: One of the weredas in Gurage Zone.

Muhur and Aklil: One of the weredas in Gurage Zone.

Ezha: One of the weredas in Gurage Zone.

Cheha: One of the weredas in Gurage Zone.

Enemore and Ener: One of the weredas in Gurage Zone.

Geta: One of the weredas in Gurage Zone.,

Gumer: One of the weredas in Gurage Zone.

Endegagn: One of the weredas in Gurage Zone.

Meskan: One of the weredas in Gurage Zone.

Sodo: One of the weredas in Gurage Zone.

Mareko: One of the weredas in Gurage Zone.

Wolkite: Capital town of Gurage Zone.

Butajira: A town in Gurage Zone.

Abarus: A family

Yawanakhwasab: A man/woman of a neighborhood or avillage.

Asat: Ensetventricosum(false banana)

zar': Kin

dabwa:	Family
betesab:	Family
teb:	clan
infoca:	Entrance
Sera:	A type of Communal association
edir:	A type of Communal association
wege :	A type of Communal association
G'ez:	A type of Communal association
Maresha:	Ploughing tool
Jeepe:	A traditionally woven carpet in Gurage
yeq'aq'et jeepe:	A traditionally woven carpet for a living/sleeping/socializing space
Goye :	<i>Big house</i>
Herar:	<i>Reception house</i>
Zeger:	<i>Store house</i>
Shemena:	<i>The ground for construction</i>
Zenger:	<i>The wall</i>
Sekur bet:	<i>The roof.</i>
Katcha:	A traditional thread used for weaving and tying purpose.
Det:	<i>Pine</i>
Woka	<i>Supports of the roof, like the umbrella stretching wires</i>
Nekotcha:	<i>A short pole to tie cattle in between</i>
Agdata:	<i>A short horizontal partition wall inside living space.</i>
Karba:	<i>Vertical posts supporting the partition</i>
Gonzye:	<i>Three clay cooking-pot-stands</i>
Tiwwa:	<i>The tall cups of clay</i>
Chiba:	<i>Pillar</i>
Sinkur:	<i>A straight wooden bar</i>
Soeur bet:	Tukul
Jafara:	Traditional Avenue
zegba:	A tree planted usually in the middle of traditional avenues
ya at sab bet:	A house for single household
gakata/ ema	<i>Walkways of thick green grass known as the foot paths, ,</i>
wusa	<i>Bread (derived from asat)</i>
araqe, sahar, and tella,	<i>Local beverages</i>
dat:	<i>juniperus procera</i>
zagba:	<i>podocarpus gracilior</i>

gwaraba:	<i>syzygium guineense</i>
wazgab:	<i>door</i>
wofincha:	<i>Internal space around the front door.</i>
atrashiya:	<i>External space around the front door.</i>
shir:	<i>crescent-shaped wooden door lintel</i>
bedar:	<i>crescent-shaped wooden door sill</i>
wangyiba:	<i>A reinforcement beam</i>
Yohyinia:	<i>At the side of</i>
Derar:	<i>A space in between living space and cattle space</i>
Gwada:	<i>A space in between living space and cattle space</i>
Kota:	<i>A mezzanine floor above cattle space</i>
Mijaca:	<i>A round fire place in front of the central post</i>
Gadarat:	<i>A round embedded black wall making the fire place in front of the central post</i>
tinkiya:	<i>A small pottery bowl</i>
tirim:	<i>A traditionally made black paint</i>
Yacabejipa:	<i>A especially designed carpet to fit around three side of the acba and conform to the edge of the mijaca.</i>
Yofincejipa:	<i>A contoured carpet to the opposite side of the mijaca</i>
Yarefte:	<i>A space in front of the cattle</i>

Three types of seat are to be found in the Gurage household, the **tagasha**, the **burcema**, and the **qwanta**.

Yawadara:	<i>Weaving matt to serve food</i>
yawadarapwa tabara:	<i>Bowl</i>
yawarapwa anqafo:	<i>spoon made of horn</i>
yarasapwa anqafo:	<i>spoon for serving purpose</i>
saf:	<i>a conically-shaped basket with a bowl top</i>
yofinchatabar:	<i>a shorter reed door</i>
kana:	<i>a local master architect/builder</i>
jef:	<i>Each foot-measurement</i>
wadara:	<i>dried asat leaves in to length of rope, ,</i>
abta:	<i>vine in vertical rows</i>
Gordara:	<i>Vertical members of wall</i>
gwala:	<i>The outside horizontal wooden strips</i>
<i>Together, the gordara and gwala are known as yafar bet.</i>	
kotakot:	<i>scaffolding</i>
yaacba gwodja:	<i>The acba hole,</i>
zapa:	<i>split bamboo</i>
yenbet chefat:	<i>Roof coping</i>

yafar bet	<i>The lower portion of the traditional house (wall)</i>
abta	<i>vines</i>
dimwamwat	<i>Connection between lower part of the roof and wall</i>
caza:	<i>Thatch</i>
yofinca imar,	<i>A traditional wooden door lock</i>
waradja:	<i>Front yard</i>
chika:	<i>mud</i>
qerkaha:	<i>bamboo</i>
g'werederas:	<i>a split wood used to build wall</i>
sotie:	<i>when the thatch is laid as its root towards the roof top in roof construction</i>
jejer:	<i>when the thatch is laid as its root towards the ground in roof construction</i>
Berashzi:	<i>Name of a village settlement one</i>
Emdibir:	<i>A town in cheha wereda</i>
Ato:	<i>Mister</i>
Quante:	<i>A town in Geta wereda</i>
Borkema:	<i>Name of a village settlement one</i>
W/ro:	<i>Mistress</i>
Yeferezye:	<i>Name of a village settlement one</i>
Yerunche:	<i>Name of a village settlement one</i>
Arekit:	<i>A town in Gumer wereda</i>
Eguraguazer:	<i>Name of a village settlement two</i>
Denka:	<i>Name of a village settlement two</i>
Geferar:	<i>Space between the cattle holding and storage within goye</i>
Segera:	<i>wooden pole</i>
Senen:	<i>Name of a village settlement three</i>
Gameso:	<i>Name of a village settlement three</i>
Maguene:	<i>Horse tying stone</i>
Gunchre:	<i>A town in Enemore and Ener wereda</i>
Wereped:	<i>Name of a village settlement four</i>
chefat':	<i>a starting surface of the roof structure at the tip of the central post.</i>
sinzir:	<i>Traditional measurement system</i>

<i>Agena:</i>	A town in Eshza wereda
<i>Bideret:</i>	Name of a village settlement five
<i>Kotchebitr:</i>	Name of a village settlement five
<i>Hawaryat:</i>	A town in Muhur and Aklil wereda
<i>Ginab:</i>	Name of a village settlement six

PART I: INTRODUCTION

Sub Topics:

- 1.1. **Introduction**
- 1.2. **Problem Statement**
- 1.3. **General Objective**
- 1.4. **Research Question**
- 1.5. **Hypothesis**
- 1.6. **Scope and Limitation**
- 1.7. **Relevance of the Research**

This part of the paper is composed of the above seven subtopics which are departure points for the research in answering questions 'what ' and 'why' to undertake it. It gives an introduction about the topic to be studied and general background on general conditions of the topic to be researched through stating problems and showing gaps in the field. It also sets a goal to be achieved by the end of the study; through formulating research questions and hypothesis. Finally it describes the scope and limitations of the research followed by its relevance in the field.

1.1 Introduction:

As one of the rich countries in possessing multi nations and nationalities in the world, Ethiopia owns those which are estimated to be above 70 ethnic (Cultural) groups (Oliver, 1997, b). In which a number of the ethnic groups have their own culture, tradition, art, philosophy, vernacular architecture etc; which structures them to retain their own value and identity. And as one element their vernacular architecture plays important role in creating inimitable image for those specific groups, in addition to its vital purposes. Some of the ethnic groups with their own vernacular architecture are: *Afar, Somali, Tigre, Sidama, Dorze, Gurage, Konso, Oromo, Amhara* etc. (Oliver, 1997,b). See fig. 1.01.



Figure 1.01, Some of Ethiopian vernacular houses and settlements

Source: Ethiopian Tourism Commission and Oliver,1997.

As scholars define it, like Paul Oliver, an architecture which belongs to some specific location, time and ethnic group which respect the context of its location and fulfil the needs of its users is said to be Vernacular Architecture. The term vernacular is derived from the Latin word *vernaculus*, meaning “domestic, native, and indigenous”. The building knowledge in vernacular architecture is often developed through local traditions; and is thus based largely upon knowledge achieved by trial and error and handed down through generations (Oliver, 1997, a). This is also the reality of most vernacular architecture of Ethiopia. And it is pleasurable to forward all reverences and appreciations to all the generations who have started their vernacular architecture and who have been transferring it by adding details of elements on it, through learning from their errors and trying new ideas and mounting it to the level of their best knowledge and handing it over to the current generation as it appears right now.

In addition to scarcity of studies in the field of vernacular architecture, especially in our country, the articles which can be found do not extend more than description and general explanation of what it is; which, in most cases, do not answer reasons behind their appearance and their ongoing process. As it is a fact that, culture of a society and its fabrics are not a static phenomenon, rather a dynamic one, which is open for change, transformation, adaptation, development or growth in time, (Rapoport, 1969) researches should take this nature of culture, while studying the vernacular house, compound and settlement (or architecture), in to consideration in their studies.

Whether we like it or not, the vernacular house, compound and settlement serves majority of the population, dominantly in rural areas of our country which is estimated to be around 80% of the total. It not only serves this magnitude of the population but it sustained for centuries fulfilling requirements of its people. Though this is the fact on the ground, concerned organs did not give it enough attention for the issue except the academic sector in recent years.

Currently many of these houses and settlements in our country are under the process of change in their nature and character by the influence of urban fabrics through modernization and globalization. Lack of studies and focused concerns on the area let the changes happen without understanding its effects and implications on the development or change of the society, which may lead to negative or positive results. Whichever is the result it should be studied properly, and guided in such a way that it wouldn't affect its current users or majority of the population and the future generation, negatively.

This research focuses on one of the vernacular house, compound and settlement of the country, which belongs to one of the ethnic groups the *Gurage*. This ethnic group has its own culture which develops vernacular house, compound and settlement based on the environment on which it survived. Of its population, around 90% lives in rural areas (CSA, 2007), using the vernacular house, compound and settlement sharing the immensely larger portion of the total population.

As it is true for other vernacular settings of Ethiopia the *Gurage* vernacular setting is also under major process of change by the influence of urban fabrics of rural towns. So

performing a study of this change or transformation in relation with its original setting is the main objective. This research focuses on understanding and transformation of the *Gurage* house, compound and settlement in terms of its physical and spatial aspects, sieving it in the filters of their components. So that it will lead to the knowledge of what is being transformed, while testing and evaluating them in socio - economic, socio - culture, environment, proximity to urban and technology, which might lead to revealing factors of transformation. In the process, the research points out relevant elements of the filters which has direct relation with physical and spatial aspect of the house, compound and settlement(HCS).

As one of the ethnic groups of Ethiopia the Gurages have their own culture, tradition, philosophy, architecture etc, which help them to have their own identity and image. As discussed the Gurage vernacular house, compound and settlement(HCS) face similar issues described above. And It is clear that it is impossible to address all the issues with in limitations of time, budget and the scope and magnitude of the research. So taking these limitations into consideration the research focuses on, understanding the original vernacular house, compound and settlement and their transformation in terms of physical and spatial aspect in relation with its factors. It also concludes in providing recommendations for the house, compound and settlement based on findings.

1.2 Problem Statement

Majority of the population in Ethiopia lives in rural areas, meaning they live using the vernacular HCS to perform their activities, (playing, chatting, sleeping, cooking, eating, socializing, loving, sitting, working, resting etc., (Rapoport, 1969)) in them. Though this is the fact, the responsible organ, be it government, NGO's or the academics, did not give due concern to undertake studies and researches for their development; to know if they have positive or negative potentials on the built environment, or to use their potentials as a base for further development in the field of housing and settlement development, or to take care of them, etc. Even the study or/and practice of architecture doesn't give enough attention equivalent to the magnitude of the issue. Because of this the vernacular house and settlement of the country are being influenced and affected in the fashion of globalization and modernization in an uncontrollable manner. This in turn results in a non-contextual transformation of the vernacular built environment in addition to their extinction and loss of their meaning, value and concept which was developed in centuries by the past generations through the process of trial and error. The house and settlement characters of many emerging rural towns of the country are good examples of the issue. Though these rural towns are physically situated in same geographical location and environment, and within same culture and society their character less resembles the vernacular built environment.

This research will be on understanding and transformation of the *Gurage* vernacular HCS. Based on the data of Central Statistical Agency (CSA, 2007) 92% of the population in the *Gurage* Zone lives in rural *kebeles* while 8% lives in town *kebeles* which is more than the country's' rural population proportion. Though this is the fact, the influence of urban fabrics

in to rural settings still breaches through various factors extending, even, to remote areas of the zone, affecting the vernacular settings of man-made built environment; which pushes it to transform.

1.3 General Objective

The general objective of this research is basically to understand and record the existing situation of the vernacular house, compound and settlement of the *Gurage* in terms of its physical and spatial aspect and show its transformation in reference with its original setting; which will be summed up with alternative design proposal in the process of transformation. This is shown in the listed points as follows:

- To pave a way of answering the stated problem and pointing into further researches and studies
- To know, understand and properly document the *Gurage* vernacular house, compound and settlement.
- To know and understand the effect of the vernacular house, compound and settlement on households.
- To understand the purpose and influence of '*korkoro bet*' (*Rectangular House Unit Covered with Corrugated Iron sheet*) on the vernacular house, compound and settlement.
- To check if there is transformation on the vernacular house, compound and settlement of *Gurage* and to know its process; identify what is being transformed and what factors are driving the transformation
- To check if the transformation is appropriate to its context and factors

1.4 Research Questions

In order to achieve the above objectives formulating a research question and answering them is a must. So the following research questions are derived from the problem statement and general objectives of the research; so that answers to these questions will lead to achieve the objectives. The research questions are as follows:

- What is the *Gurage* vernacular house, compound and settlement in terms of physical and spatial aspects?
 - o What are the procedures, rules or traditions and reasons behind, forming a village, parceling plots for each household and building housing units?
- What are the effects of the vernacular house units and village settlement of the *Gurage* on day to day life of households?

- o What do the vernacular house units and village settlements lack to satisfy the needs of the dwellers in terms of physical and spatial aspects?
- What are the construction processes, techniques and materials being used to build the vernacular house units of *Gurage* and how available are 'skilled' laborers and construction materials?
- Is there transformation on the vernacular house, compound and village settlement in terms of physical and spatial aspects?
 - o What are the factors of transformation?
 - o Which components are being transformed?
 - o What type of transformation is occurring?
 - o Who are the actors in the transformation?
 - o Is the transformation appropriate?

1.5 Hypothesis

The dynamic nature of culture, which creates vernacular house and settlement, allows transformation in the built environment through a process in the continuum of time. In this era of globalization where mixing of cultural fabric exists and where the advancement of technology is taking place, it is challenging to protect a vernacular HCS from the influence. In the sub-urban and rural villages of the *Gurage* it is normal to see the so called '*korkoro bet*' (*Rectangular House Units Covered with Corrugated Iron sheet*) in a settlement, which, the researcher assumes, is the result of influences from suburbans or rural towns and others. This in turn creates inappropriate transformation on the blended settings of the vernacular built environment with nature, in addition to its indirect consequences.

1.6 Scope and Limitations

Scope

The research focuses on understanding and transformation of vernacular house, compound and village settlement of *Gurage* in terms of physical and spatial aspect, through looking deep into the existing vernacular house, compound and village settlement . After the study and analysis, it investigates and point out what it is, whether there exist transformation or not and if there is, it will look into the type and factors of transformation after which the study checks the appropriateness of transformations through using filters and checking mechanisms based on its components. After analyzing all these points it will be finalized with a recommendation extracted from the outputs of the analysis or findings and conclusion.

Limitations

This research is limited to the study of physical and spatial aspects of the subject except that it refers important relevant topics in cultural, social and economic issues which have direct and indirect linkages with the main topic. It faces limitations in getting specific reference materials on the study topic and case areas. In addition difficulties in accessing case locations in terms of transportation was challenging and it is major issue of the *Gurage* zone. Though it is up to the researcher's decision on how to manage fixed time and budget; the existing system of budgeting, which is research proposal follows fixed budget, do not support researches which costs more than 6000 Ethiopian birr, which doesn't even cover the printing cost of this specific research in letting the researcher pay the rest which in this case is more than a triple, should be adjusted in such a way that, encouraging researcher to address problems of the country other than the capital city, Addis Ababa. The research is also limited to existing theories of the research topic which were available and accessible to the researcher within the frame of time and budget.

1.7 Relevance of the research

Relevance of the research is stated below:

- To transfer and preserve knowledge of the past and current generation of the *Gurage* culture in vernacular house, compound and settlement to the next generation
- To help planners, policy makers and professionals to predict the future of vernacular house, compound and settlement and be prepared while working on rural settlement and planning.
- It helps researchers and organizations working on sustainability issues of rural settlements as an indicator.
- It can also be used to extract ideas and concepts which can be applied in the profession of urban design and architecture.
- Inspiration for students and researchers to study and contribute to the field of vernacular architecture and settlement, specially in Ethiopia, by indicating gaps in the study.

P A R T II: Research Method

Sub topics:

- 2.1. **Introduction**
- 2.2. **Case Study as a Research Method**
- 2.3. **Case Selection Criteria**
- 2.4. **Cases Selected**
- 2.5. **Data Sources, Tools and Collection**
- 2.6. **Structure of the Research**
- 2.7. **Conceptual Framework of the Research**

The 'How' to answer the research questions and achieve objectives of this research is explained and described in this chapter through the above stated sub-topics.

2.1 Introduction

As it is explained in the previous sections the research has two major focal points. One: a study of understanding the vernacular HCS of *Gurage*; and two: Its transformation. Case study research method is the proper way of conducting such type of research, as transformation is a process and time dependent. In order to overcome these tasks both qualitative and quantitative data analyzing methods are used on the research. The quantitative method help to manage numeric data of the cases; and it is organized and analyzed using software like SPSS. and Micro-soft office. And the qualitative method used to manage non numeric data like (spatial, 'social value' and others) of the cases and it is analyzed using typological and comparative analysis which helps to relate and evaluate cases within themselves and within a range of time line. While doing so categorization, summarizing, tabulation and other techniques like graphical representations were implemented to create pattern of the collected data which is helpful to simplify the complex nature of the study.

2.2 Case Study as a Research Method

Case study research methods can be used in various research types such as:

- To explore new areas and issues where little theory is available or measurement is unclear;
- To describe a process or the effects of an event or an intervention, especially when such events affect many different parties; and
- To explain a complex phenomenon.

"Although typically associated with exploratory purposes, Yin suggests the methodology may actually be more powerful for explanatory purposes in its ability to answer questions of 'how' and 'why'. The case study methodology is frequently applied in program evaluation studies or studies that track changes in complex systems. It is also not unusual for researchers to combine case studies with quantitative analyses that use larger data sets. The nature of the problem and the theories of interest dictate the mix of methods used to answer any particular set of questions" (Linda T. Kohn, 1997).

2.3 Case selection criteria

The decision to study the '*Gurage*' vernacular HCS is made because of the inspiration from a course called 'Form and Function, House and Settlement', while participating in sustainable rural dwelling unit (SRDU) research project of housing and sustainable development chair, which is located in *Gurage* zone.

After the decision to study the *Gurage* vernacular house, compound and settlement, it becomes obvious that the cases should be located in *Gurage* zone where the culture group is located. And of the zone six *weredas* are chosen, from which a village settlement located around the main town of the *wereda* is taken to be studied. Since the research focuses on understanding and transformation of the three components, the vernacular house, compound and settlement, the cases are chosen taking the three mentioned components in to consideration. And once the criterion for the settlement is set, other components are chosen randomly within it.

Mainly the cases are village settlements which contains the other two components of the research which are compounds and house units. The village need to be somehow in touch with the main town of the *wereda* because the researcher assumes rural town are ports for the transition of modern elements from urban to rural areas, it has to contain both the vernacular houses and '*korkoro bet*' architecture and preferably the village need to be historical and could be exemplary in its cultural essence in the area, so that it will tell the variation between present and past.

2.4 Case Studies selected

As the research is on HCS level of the Gurage vernacular architecture, the cases are selected from Gurage zone. Six weredas were selected from the existing thirteen. From each wereda one village was selected to assess the research questions from randomly selected households. Details are given in the following table.

Zone	Wereda	Kebele / Got' (village settlements surveyed)	No.of households surveyed	Settlement cases selected	No.of Compound cases selected	No.of House cases selected
Gurage	Cheha (Emdibir)	Berazshi, Borkema, Girardibir, Yeferezye and Yerezem	14	Berazshi	3	3
	Gumer (Arekit)	Denka and E'guraguazer	5	E'guraguazer	3	3
	Geto (Quante)	Senen (Gemeso)	5	Senen (Gemeso)	3	3
	Enemor and Ener (Gunchre)	Shanka (Wereped)	4	Shanka (Wereped)	3	3
	Ezsha (Agena)	Desene (Bideret and Kotchebitr)	7	Desene (Bideret and Kotchebitr)	3	3
	Muhur and Aklil (Hawariyat)	Ginab (Dedegba)	19	Ginab (Dedegba)	3	3
	Total		54	6	18	18

Table 2.01 Details of selected cases

2.5 Data Sources, Tools and Collection

Both primary and secondary sources are used to get important data for the research. Primary data sources are the dwellers, their physical built environment, professionals, government officials and others; the researcher conducted discussions, interviews, observations using questionnaires, sketches, measurements, pictures, audio and videos and other recordings carried out. Secondary sources are collected from books; research papers both published and unpublished, magazines, reports, brochures, maps, drawings and sketches.

2.6 Structure of the Research

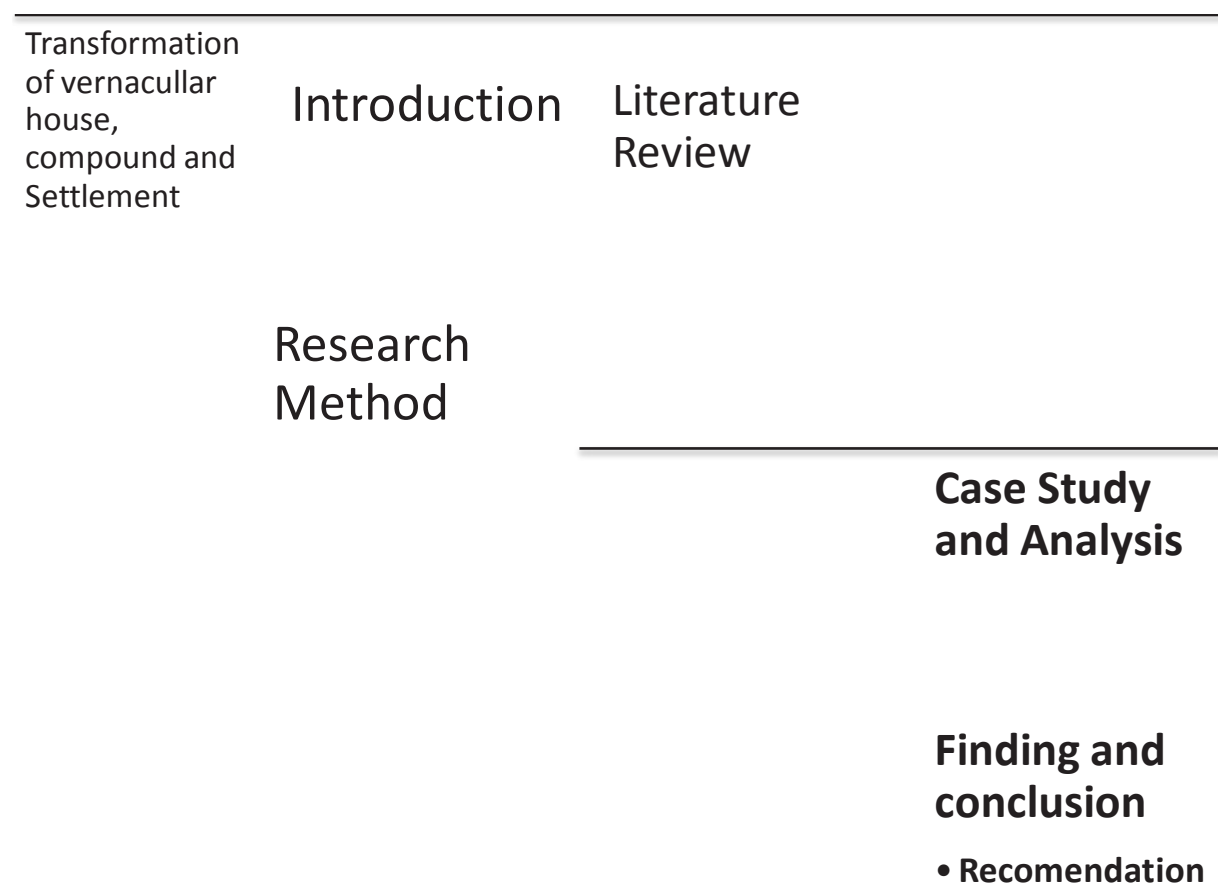


Figure 2.01 Illustration of research structure

2.7 Conceptual Framework

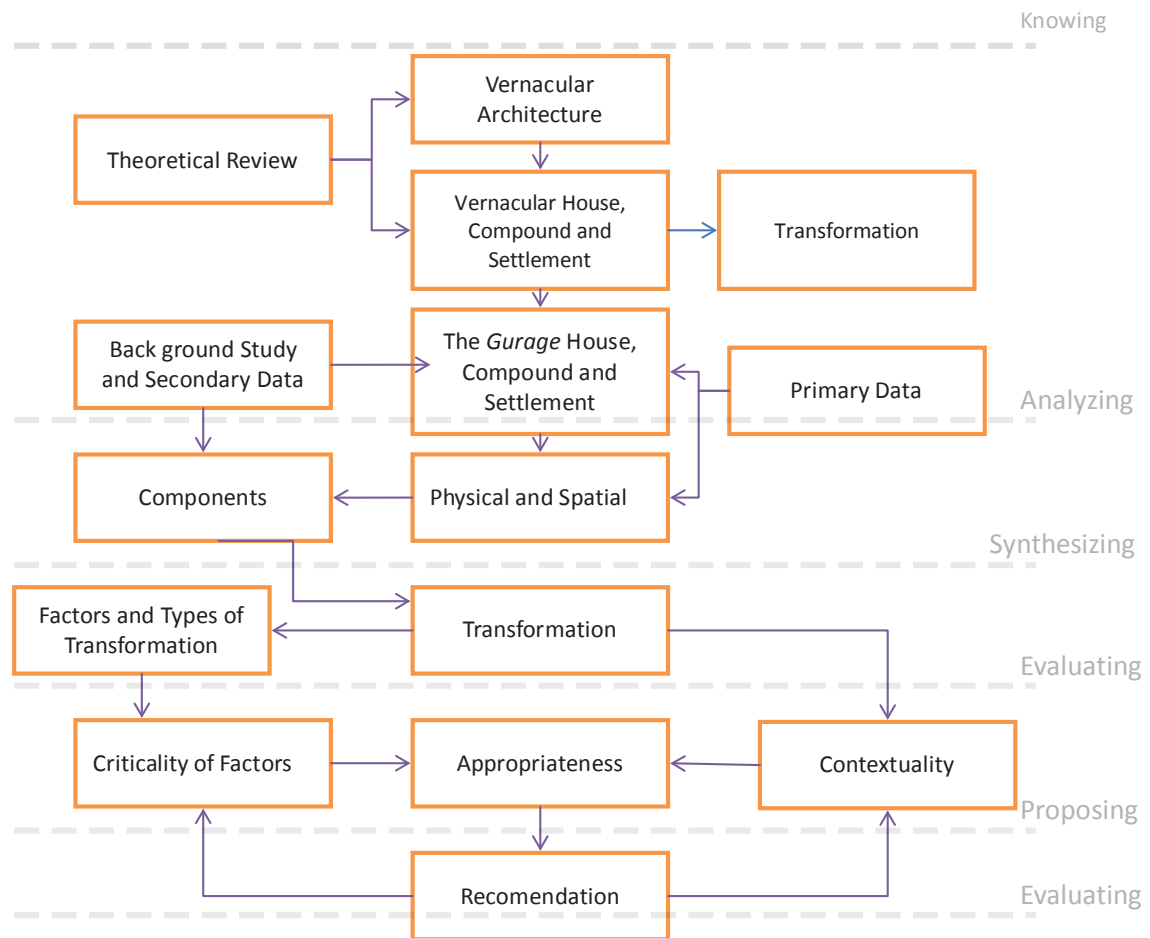


Figure 2.02 Illustration of Conceptual framework

PART III : LITERATURE REVIEW

Sub topics:

- 3.1. **Introduction**
- 3.2. **Operational Meanings and Definitions**
- 3.3. **Theoretical Review**
- 3.4. **Contextual Review**

This section traces back past experiences on the research topic in global and local context, discusses issues within the above four sub topics. Which are; the *introduction*, to give explanation and description on what this part is going to discuss and the topics it covers. *Operational meanings and definitions*, gives explanations to create a common understanding on basic terminologies of the paper. *Theoretical review* discusses theories and arguments on related topics of the research in creating a theoretical framework for the thesis. In the *contextual review*, general back ground studies and topics discussed in the theoretical review section are checked in the local context.

3.1. Introduction

In this part important topics related to the research are reviewed so as to know and understand past experiences and theories in global context and check those theories with local contextual background based on available resources. In the first sub topic, it sets a common ground to create similar understanding on basic terminologies and conceptual definitions of the research as an operational meaning. In the theoretical review it gives a framework under which the whole research circulates. It is composed of the following titles: General concept, Determinants, Modifiers, Transformation and Sustainability. Which are discussed in their respective sections, having the vernacular HCS as a core discussion point. The contextual review gives a general background about contexts of cases to be studied and tries to relate and see topics in the theoretical framework within the local context in extracting related topics from various secondary sources.

3.2. Operational Meanings and Definitions:

Before any discussion on the topic it is important to break down and define the basic essence of important words in the research topic, which will help to have common ground throughout the study. So the operational definitions and meanings starting from their dictionary meanings are as follows:

Vernacular: *In the study of language vernacular is the indigenous idiom; the word is derived from the Latin 'vernaculus', meaning 'native'. (Oliver 97)*

Architecture: *Art and science of designing and constructing a building (any building). (Microsoft Encarta, 2009)*

House: *a building made for people to live in, especially one built for a single family of occupants (Microsoft Encarta, 2009)*

Settlement: *'the house cannot be seen in isolation from the settlement, but must be viewed as part of a total social and spatial system which relates the house, way of life, settlement, and landscape. Man lives in the whole settlement of which the house is only a part, and the way in which he uses the settlement affects house form'(Rappaport 69)*

Transformation: *a complete change, usually in to something with an improved appearance or usefulness (Microsoft Encarta, 2009)*

Vernacular architecture: *Vernacular architecture comprises 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 living of the cultures that produces them. (Oliver 97)*

Vernacular house: In the researcher's opinion it has equivalent definition with that of vernacular architecture except that 'house' doesn't, obviously, include all buildings as it is defined above, so, **vernacular house** comprise the dwellings, for domestic activities, 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 houses are built to meet needs, accommodating the values, economies and ways of living of the cultures that produces them.

Vernacular settlement: merging definition of 'settlement' into 'vernacular architecture' it can be understood as: a total social and spatial system which relates the house, way of life, settlement, and landscape of a people; related to its environmental contexts and available resource; owned, established and controlled by the people. It is a system to meet needs of the people accommodating the values, economies and way of living of the culture that produces it.

3.3. Theoretical Review

Man existed with no shelter before adopting his environment and formed his own shelter to dwell-in. Through time these shelters possess physical appearance which is determined by and derived through various factors and forces, as argued by Rapoport (Rapoport 1969), and understanding deriving or determining factors of vernacular house, compound and settlement will help to understand reasons or factors of the transformation indirectly. The two guiding focuses of the research are, understanding what the vernacular HCS of *Gurage* are and finding out their transformation. The theoretical frame work gives a base in supporting and guiding the approaches or focuses in discussing the general concept, determinants, modifiers, transformation and sustainability theories having the vernacular house and settlement as a core element.

3.3.1 General Concept

The general concept of vernacular house and settlement starts from the single unit of society which is family. Family is the basic unit of all society which is composed of male and female couples with their own children.

"As family associations are maintained and, as they grow by relationship with other families, frequently lead to social structure that involves all members of the interconnected family groups. Patterns of behavior, individual and inter family connection, respect for beliefs and willingness to defend territory, generally result in 'structured association for mutual benefit'. Such benefit may include the collective development of an environment and its resource, the clustering of families in settlement and the share knowledge of the construction of an appropriate form of shelter." (Oliver, 1969, p. 23)

Nature of the environment highly dictates the survival and continuity of a community.

Access to resources is highly variable dependent on environmental condition which may range from mountain region, to woodland or desert, with climatic and seasonal variation that can be severe. All these may affect the nature of the house or shelter and settlement that communities may construct for their own protection and use.

Through time people adopted and understood their environment in order to exploit its potential and resources with appropriate treatment and emerging skills. Water and food had been the most important resources for survival. Depending on the environment they adopted some become food gatherers, animal hunters and nomadic by creating routes which enable them to pasture animals in spite of seasonal variations. Sedentary cultures, which are highly dependent on streams and brooks, become causes for the establishment of settlements while learning cycles of cultivation and harvesting with advanced agriculture being developed.

Various types of building forms have been developed in time, like domes, cone, cubic, rectangular prism or different combination of these, in order to accommodate the spatial, environmental and domestic obligations of societies. While developing forms of buildings they pass down their tradition and culture through generations, while others acquired and adapted technologies; which guarantees the continuity and sustainability of traditional structures.

Depending on the variable economies of cultures and specialists within them, vernacular architecture devised and refined to accommodate specific purposes; like storage, barns, kitchens etc. in addition to its obvious purpose which is dwelling. (Oliver, 1969)

3.3.2 Determinants

There are number of factors which determine the physical and spatial forms of vernacular house and settlement. Of which socio-cultural factors plays major role in the process. *"House form is not simply the result of physical forces or any single causal factor, but is the consequence of a whole range of 'socio-cultural' factors seen in their broadest terms."* (Rapoport, 1969 P. 48). Socio-culture is composed of culture (governing ideas, institutions and conventionalized activities of a society), Ethos (the organized conception of ought or belief), World view (way of people characteristically look out upon the world) and National character (the type of people and their personality that occurs in the society) which are components of '*genre de vie*'. In general it can be said that houses and settlements are the physical expressions of the genre de vies, and this constitutes their symbolic nature. It is also a fact that physical determinants affect the physical and spatial forms of house and settlements. Of which climate conditions, method of construction, material availability and technology are the major ones.

Basic needs have crucial role in the process of form determination; which may include the need to breath, eat, drink, sleep, sit, and love etc. The needs by themselves do not have direct role in the determination, rather how and where the activities took place tells us how the activities determine the physical and spatial forms of house and settlement. Meaning it is not whether one cooks or eats but where and how it is done (Rapoport, 1969)

3.3.2.1 The Relation of House and Settlement

House and settlements are integrated elements of the total social and spatial system which cannot be segregated one another. They relate and associate peoples' way of life in facilitating interaction with the natural environment. For example in some areas houses are used as meeting and socializing spaces while in others settlements took the role.

There can simply be two extremes of settlement characters; one consideration of settlements as a setting for life and its activities where houses serve as a more private part of the living realm. On the other hand dwellings considered as a total platform of life and settlements as connective tissues which is secondary. There are also characters in between the two extremes.

"Houses, settlements, and landscapes are products of the same cultural system and world view, and are therefore parts of a single system. It is important to see the house not only in relation to the basic dichotomy of settlement types as settings for life and their variants along the total space –use scale, but also as part of the specific system to which it belongs" (Rapoport, 1969 P. 69).

To this point it is tried to show the general discussions of determining and driving forces of the vernacular house and settlement by the two pioneer authors of the field in the above topics, and looking deep into specific components of determinants and their influences on physical and spatial components is important.

3.3.2.2 Culture

Based on the norm and expectation of culture of a society there are routines with repetitive characters and sequences of activities along with their houses, shared by members of the family which is the basic unit of a society. Every culture has its way of economy to support itself which characterize sharing of responsibilities within the family members. The economy might base itself on hunting, foraging, pastoralism, agriculture or the exchange and marketing of surpluses. This factor also determines type and location of their settlement and degree of permanence of the dwelling structures. How a family interacts with and have influence on the nature of their accommodation is determined by considerations of family type and cycle of generations in its multiple forms. Obtaining food, its storage, preparation, cooking, and consumption as nourishment and ritual behavior are some of the influences (Oliver, 1997,a, P.77).

Apart from its physical structure culture express the conceptual realities of its environment and ritual meanings communicating through house forms, configurations, details and materials. It can also be expressed through behavior patterns of their occupants and users. Though there are number of reasons which forces nomadic people choose their way of life the sustained interpretation of erected structures are crucial for their continuity. Socialization through various activities like playing is as important for nomadic children as for those of sedentary families. Since learning is mainly through experience, the role of play or the pre enactment of mature

roles and values are of major importance (Oliver, 1997,a, P.77).

3.3.2.3. 'Genre de vie'

The basic essence of genre de vie is attached with the concept, process and reasons of survival of people on earth. The most important aspects of genre de vie which affect the built up environment are: Basic needs, Family, Privacy, Social intercourse

Since generalized meanings of the components are vague, depending on goals and values of the culture or sub-culture, it is given a specific and relative meaning below. (Rapoport, 1969 P. 61).

Basic needs

Breathing is one of the basic needs to survive; which can be linked with openings of built structures in order to intake fresh air and/or ventilate suffocated air; but because of their culture high concentration of smell is acceptable in built structures of some people, like Eskimos, which determines opening character.

Sitting is a basic need, yet some cultures rest by squatting, as is common in Asia, others stand on one foot, as do Australian aborigines and some Africans, and it could be shown that the manner of sitting can affect house form and change living habits. The impact of the introduction of chair, which would revolutionize living habits and have major social consequences.

The need to take off shoes, imposed by the use of mats, would disappear, hence also the special covered space porch or verandah where they are taken off and left; the need for shoes which are easily taken off would be eliminated, and also the need for special floors. Different postures would affect stance, carriage, costumes, the character and shape of all other furniture, and the use of cupboards, wardrobes, mirrors, lamps, and pictures. The chair would also affect the sitting height, hence changing the placement and type of windows and type of garden. Similarly, with regard to sleeping, it is not the fact of sleeping which is significant, but the furniture, arrangements, and spaces used which affect the house. (Rapoport, 1969 P. 61-63).

Family

Every culture has its own family character and family structure, which is basic to all society, that can critically differentiate house forms. For example a number of cultures might allow extended family in a household while others discourage; extended family group can lead to a courtyard cluster in some cultures, while some makes it long and others makes it in group determining its form (Rapoport, 1969 P. 63-65).

The Need for Privacy

Spatial characters of a house form can be characterized through privacy parameters.

Privacy is an expression or attitude to sex and shame; feelings of personal worth, territoriality and individualism also affect attitudes to privacy. These are the factors which let a space partitioned or open in order to serve private, semi private, semi public or public activities in hierarchy. The desire for privacy may also take forms related to the separation of domains. This can be seen in various cultural contexts, where the buildings traditionally face inwards and seems independent of the climatic zone or site, occurring in both cities and villages (Rapoport, 1969 P. 66-68).

Social Intercourse

The meeting of people is also a basic need, since man has been defined as a social animal. What concerns us is where people meet, whether in the house, the café, the bath, or the street. It is not the fact of meeting itself that affects the form of the habitat. The ease, with which people can orient themselves in the city (settlement) is important in helping them socialize (Rapoport, 1969 P. 68-69).

As it is seen above, sociocultural components play important role in determining house and settlement forms of the vernaculars. This helps in checking the role of sociocultural components in determining the vernacular house, compound and settlement of the *Gurage*, in addition it helps understand what it is. The next topic will see what the modifying factors of the vernaculars, in general are.

3.3.3. Modifiers

3.3.3.1. Environment

Environmental contexts largely determine the existence of vernacular cultures and partially shape them. A number of cultures are physically expressed through their own vernacular architecture, but the ability to overcome challenges of physical conditions, the economy on which their life depends, their relationship to the land they occupy and the form their built structures takes highly depends on to the quality and potential of their environment.

The character of current population distribution is a result of major movements of former generation which might be caused by need, competition, curiosity, exploration, conquest and exploitations. Topography and orientation, availability of land and building resources, defense and socio-spatial relationships communications and market opportunities are among the factors that influence the diverse forms of vernacular settlement patterns. No two are exactly alike, though many share morphological characteristics with the plans employed by other cultures (Oliver, 1997,a, P. 126). Environmental changes can affect the vernacular setting through pushing its components to be modified, in a direct or indirect influences.

3.3.3.2. Choice of approach towards nature

The attitude towards nature and the site would be an important aspect of the creation of house form, or its modification by the site, and that the relation of man to landscape is the first

aspect which needs to be considered. There are number of classifications of such attitudes for example: Religious and cosmological (*The environment is regarded as dominant, and man is less than nature.*), Symbiotic (*Here man and nature are in a state of balance, and man regards himself as responsible to God for nature and the Earth and as a steward and custodian of nature.*), Exploitative (*Man is completer and modifier of nature, then creator, and finally destroyer of environment.*) Self consciousness, lack of pretension or desire to impress, direct response to way of life, climate, and technology, use of method of building, attitude toward nature and landscape, all play a part. The latter affects the relation of built form to land form, the making of places, and consequently affects the building form itself (Rapoport, 1969 P. 75).

3.3.3.3. Material, Technology and Skill

Social and cultural grounds like way of life and shared group values decide what form a house shall take. But once it has been decided whether the dwelling is to be individual or communal, permanent or portable, the whole setting for life or part of the larger realm of the settlement there still remains certain universal problems, related to construction. 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. In the same way that the house responds to the physical stresses of climate, heat, humidity, cold, radiation, and light – it must also respond structurally to the mechanical stresses- gravity, wind, rain, and snow. Construction and materials are best regarded as modifying factors, in spite of their fundamental nature, because they do not determine form. They make possible forms which have been selected on other grounds, they make certain forms impossible, and, in acting as a tool, they modify forms.

Local builders are able to conserve their materials because they have detailed and precise knowledge of the behavior and characteristics of materials, not just in terms of climatic response and construction, but also in regard to weathering – how the materials and building fabric will stand up to the ravages of time and weather. This understanding tends to lead to clear, straightforward solutions to the problems posed by gravity and weathering (Rapoport, 1969 P. 104-105).

Though vernacular architecture has often been admired for its rational and thrifty use of sacred resource it is evident that the materials used are those that are abundant in the given circumstances. Pursuit cultures, food gatherers and nomadic or semi nomadic pastoral societies have depended on animal products for shelter provisions. As is the case with most building materials, this requires preparation – the cleaning and curing of hides or the spinning and weaving of wool for tent cloths (Oliver, 1997).

3.3.4. Transformation

To those who consider that the use of locally available materials is 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 considerably extended the life of contemporary traditional building. Used and manufactured materials may yet provide the basis for the emergence of new vernacular forms. (Oliver, 1997 P. 193-94)

3.3.4.1. Control and authority in vernacular Architecture

Central to the explanation of continuity and change of vernacular architecture is the control and authority by which 'owner' and community conceive the public environments, they see and feel, and the ones they allow to enclose them. Those thorny matters often carry a reference to tradition since decisions about the shape of the future are based on the influence of precedent. Lest one assume that vernacular architectural contexts are static points on the globe, tradition takes into account the balance of individual innovation and social custom in the generation of material culture (Martin 1983; Bronner 1992, 2000a; Glassie 1993). Concern for the tradition in architecture therefore poses not only the question of what tradition is within a society or community, but even more importantly, what it does (Simon J.Bronner, 2006 P. 23-48).

3.3.4.2. Constancy and Change

The cultural meanings attached to vernacular built forms would disappear when life style of the people who created them changed. It is also possible that housing and settlement forms could be utilized and functional enough without their attached cultural interpretations. Some aspects of behavior and way of life are constant, or change very slowly, and the changes in old forms might occur due to unsatisfactory relation to the way of life. In the contrary acceptance of vernacular forms might be due to their value rather than a true continued validity or functionality. Having both arguments possibly exist in different cases there are elements which are constant in the process.

People and their institutions have elements of constancy and change which affect the nature of built form and can be considered in relation to the biological nature of man, his perception and his behavior; of which the biological nature is more constant than the other ones which are changeable ones (Rapoport 1969, P. 78-82).

3.3.4.3. Developmental approach

Vernacular architecture can be developed through using its characteristics to achieve a 'better' shelter and settlement, by using and developing local cultural and material resources, through which continuity with change can be demonstrated, while incorporating the new and the external elements to meet contemporary needs.

Rejection of the vernacular characters might be caused by the improvement in income and living conditions which lead to altering and increasing needs and aspirations. People in economically buoyant locations look to 'modern' architecture for functional and status reasons.

Where they relate their vernacular architecture with poverty from which they want to escape. This might also be linked with the increasing modern construction alternatives and decline of vernacular ones.

It is easier to promote a developmental vernacular in the rural context given that the local vernacular is more prevalent and inappropriate and modern urban alternatives are more distant. Consequently in china for example, improved rammed earth walls have spread across the country side, and a variety of roofing types, from slender vault to tiled roofs to large span timber trusses, have been developed in rural communes. These maximize the use of local resources, labor and materials such as fired brick, clay tiles and construction timber and minimize the use of imported materials such as concrete and steel. Similarly Indonesian rural people (non-formal residential schools and community development organizations) have used local bamboo and timber technology to construct water supply systems, schools and housing in a spirit of financial and technical self-reliance (Farouk Afshar and John Norton, 1997).

3.3.4. Sustainability

Vernacular architecture is the highest form of sustainable building, as it uses the most accessible materials, and employs the widest available technologies.

At the beginning of the twenty-first century, globalization has a forceful impact on every aspect of our lives. From music to food, and from lifestyle to architecture; there are no areas of our existence that have not been affected by global forces and values. While bringing convenience in living and communication, this globalization has a homogenizing effect and threatens to reduce the meaning of the architecture and built environments we live in; meaning naturally comes with cultural awareness and historical continuity. In order to combat the threat of homogenization, the issue of cultural appropriateness will have to be taken more seriously.

In a world where the scarcity of energy resources and synthetic materials is only likely to increase, the determination to make use of abundant local resources and the desire to respect and engage with the complexities of cultures, historical contexts and the pressing needs of habitat, will most certainly give rise to the impressive, durable and socially conscious vernacular architecture (Suzha Ozkan 2006, P.108-09).

3.4. Contextual Review

In this section a general background about the study area is given. After which, local contextual reflection of the theoretical review is discussed in respective sub-titles; which in turn creates a link and comparison between the theoretical review and context of the study area or *Gurage*.

3.4.1. General Background

a. Geographical Location of Gurage zone

Gurage zone is one of the 13 zones of southern nation's nationalities and peoples, regional state. It is located at 430km north of the southern nation's nationalities and peoples, regional state capital (*Hawassa*) and 155km south of Addis Ababa.

Relatively, Gurage zone is bordered in the North, Northwest, Northeast and East by Oromiya region, in the West by Yem special wereda, in the South by Hadiya zone, and in the South east by Silte zone. Astronomically, Gurage zone extends from 7.76°—8.45° north latitude and 37.45°—38.71° east longitude.

Gurage zone is structured into thirteen weredas such as Abeshge, Kebena, Kokir Gedebano, MuhurAklil, Ezha, Cheha, EnemoreEner, Geta, Gumer, Endegagn, Meskan, Sodo, and Mareko weredas as well as two town administrations namely Wolkite and Butajira town administrations. On the other hand, Gurage zone contains 437 rural kebeles and fifteen urban centers (Welkite-Gubre Structural Plan Document, 2010).

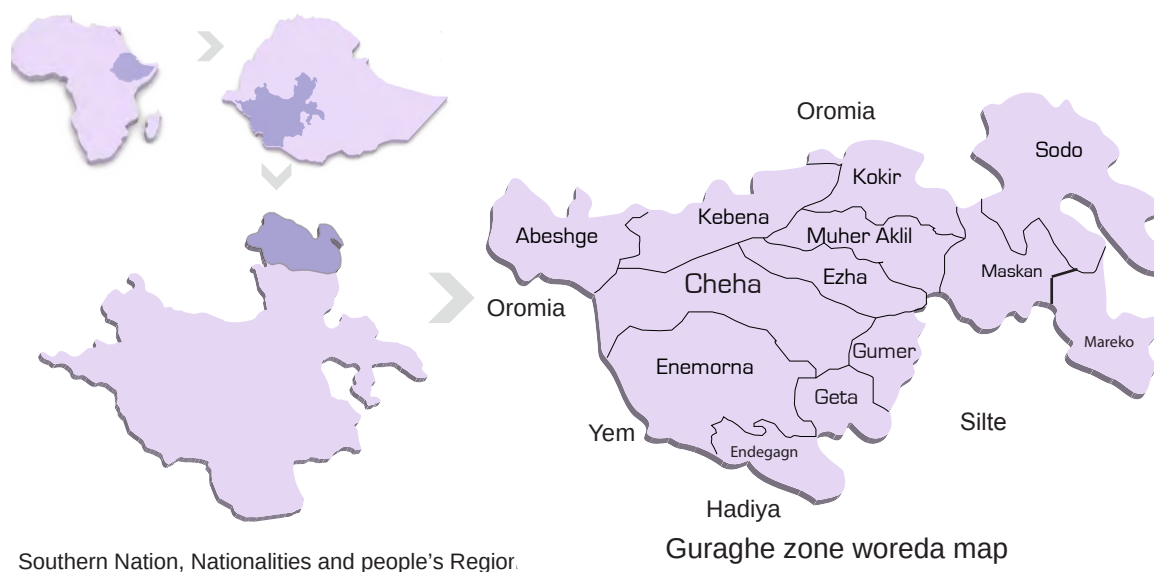


Figure 3.01 Location map of Gurage Zone

b. Population size and distribution of Gurage zone

According to Central Statistical Agency ,2007, the total population of Gurage zone is 1,280,484. It shares 8.5 percent of the southern region population (i.e 15,042531). Gurage zone stands in 4th position in southern region in terms of zonal population next to Sidama, GamoGoffa and Wolayta zones respectively (CSA, 2007).

From the total population of the study area, the number of male population 622,254 and that of female is 658,229. The percentage share of female population in the zone is 51.5%

whereas the percentage share of that of male in the zone is 48.5 % . This indicates that apart from other zones in the country, most of male population in *Gurage* zone live out of the zone mainly for commercial purpose. As a result the zone is characterized by male deficit population. There are also disparities in number of male and female population among *weredas* of *Gurage* zone (CSA, 2007).

The zone has an area of 15932 sq.km. For the purpose of administration, the zone has been divided in to twelve *weredas* (districts), two provisional city administration and 421 *kebeles* (local communities). The size of *woredas* varies from 8182 sq.km in *Enemor Ener Wereda* to 127 square km in *Endegagn Woreda*. The overwhelming majority, 92.4 percent lives in rural areas leading an agricultural life (CSA, 2007).

The recent population census (2007) revealed that *Gurage* Zone had a total population of 1,280,483 of whom 622,254 were men and 658,229 were women .Out of the total population of the Zone about 1,158,880 or 91% were rural dwellers while the remaining 121, 603 or 9 % were urban dwellers .With an estimated areas of 5932 square kilometers. *Gurage* Zone had a population density of 193.4 people per Square kilometers which is greater than the regional average of 133.9 (CSA, 2007).

Gurage Zone is inhabited by different nations and nationalities. The *Gurages*, the *Kebeanas* and the *Marekos* having along trace of settlement history among others like *Amharas*, *Oromos*, *Kembatas*. The largest population subscribes to the *Gurage* nationality- 89%, followed by the *Marekos* 2% and the *Kebeanas* 1.8%, (*Gurage* zone socio economic profile, 2008).

3.4.2. Socio - Culture

a. Family Structure

The *Gurage* homestead may consists of the *abarus*, related or unrelated, permanent or temporary residents which are headed by and under the jurisdiction of the husband and father of the extended family group. Depending on the availability of money and land a son might build his own house and start family, but still remains in a subordinate position of his father till the father passes away. A senior male of the agnatic group is always at the head of the authoritarian structure. Even though variation might occur in the organization of authority in the home stead owing to the death of absence of the father, there is no change in the structural form of this authority. Boys are considered adult and ready for marriage at about the age of 18, and some of them do marry then, but many must wait longer before obtaining a wife; they must then wait even longer before becoming head of a homestead (Shack, 1966 P.107-09).

b. Village Settlement

The smallest territorial and political unit of the *Gurage* is its village settlement. A *Gurage* village is owned by and belongs to members of the local community occupying a defined area of land where its boundaries recognized, acknowledged and respected by other groups living outside. A political unit is formed by local aggregate of related patrilineal homestead, the head of which manages internal village matters. The relation ship of multiple villages create inter

village politics. Ideally all inhabitant of a Gurage village should be related. Older *Gurage* affirm this by pointing out that village composition in the past was always based on kinship.

The village may be considered as a corporate group which controls the right of ownership and use of its residential and arable land. It may own grazing land and streams independently, or these may be shared with neighboring settlement. Village heads, as representative of the minor lineage, uphold the rights in village land as a corporate body; no homestead can dispose of its land to an 'outsider', that is, one from another clan, without approval from minor lineage heads. The control of land by the corporate group is a means of restricting the expansion of the community through immigration.

The head man and elders of the village meet often to make economic and political decisions. Economic assemblies are frequently called to discuss the formation of work parties, the distribution of market goods, or the sale of cash crop. Political assemblies are called less frequently than economic ones, and they may be called by any adult male of the village or by the village headman interwoven through both types of assembly is the thread of '*yawanakhwasab*', which reinforce the principle of village life. The daily pattern of inter village behavior favors visiting, so that people often see each other and frequently stop to chat and drink coffee or *tella*-beer, and eat *asat*- bread or roasted grains, as they pass each other's homes. All of this reduced in one way or another, from the formal character of village behavior.

The ideal composition of a *Gurage* village, as stated above, is that all men living there are members of the same minor lineage. Elder *Gurage* usually given an explanation of this idea by constructing a genealogical model based on a living male in the community. They can demonstrate with this model, whenever they take the time and effort to do so, that any male member of the minor lineage can be traced to the founder of the clan. *Gurage* are not faced with the problem of tracing their ancestor's relationship to the area of settlement beyond three or four generation(Shack, 1966 P. 91-98).

Explanations are given in the above two sub-topics about social structure issues of a single family and a community in a village with respect to cultural implication of one on the other. It also shows how integrated, the neighboring families and villages are, through strong social value in addition to their physical attachments. Under the next sub topics various traditional social activities which tie the society in more strong way are discussed.

c. Traditional Social Services

Some the traditional social services which are related with the research topic are Sera, *Wege* and *G'ez* which are discussed below.

Sera

Sera in its generalized meaning is taken for *edir* and is a cooperative undertaking. The people under one sera are considered to be friendly and each one of them has obligation to respect interest of others. Main services in the sera include; funeral services if any member or one of his families passes away, mourning attendance, provision of cash

money and food item, fuel, herding the cattle, mowing grass for the cattle, frequently visit of the sick is another obligation. (Gebreyesus,1991, P 118-19).

wege

It Is herding of cattle belonging to three or more people in the neighborhood. Those individuals who have no children or whose children go to school get together and agree to herd their cattle on a rotating basis which is usually done in the summer (Gebreyesus,1991, P 120-21).

G'ez

It is a joint force or action pulled together to carry-out certain types of services that cannot be undertaken individually. Hand ploughing with *maresha*, *esset* planting and cultivating, *esset* scrapping in a big quality, threshing barely, wheat, and other cereals, handicraft, rural technology, building of *tukuls*, weaving for commercial purposes, etc., are the type of services conducted through *g'ez*. It is used both by men and women. Making sleeping mats (*jeepe*), local carpets (*yeq'aq'et jeepe*), scraping or decorating *esset* in a large scale are done by women through *g'ez* (Gebreyesus,1991, P 121).

3.4.3. Environment

a. Climatic Condition

The mean annual temperature of *Gurage* zone varies from 7.5°C in the highland areas of *Geta*, *Meskan* and *Kokir gedebano woredas* to 25 °C in lower places to the western tip of *Enemor Ener* and northwestern tip of *Abeshge woredas*. See Climate Map of *Gurage* zone :

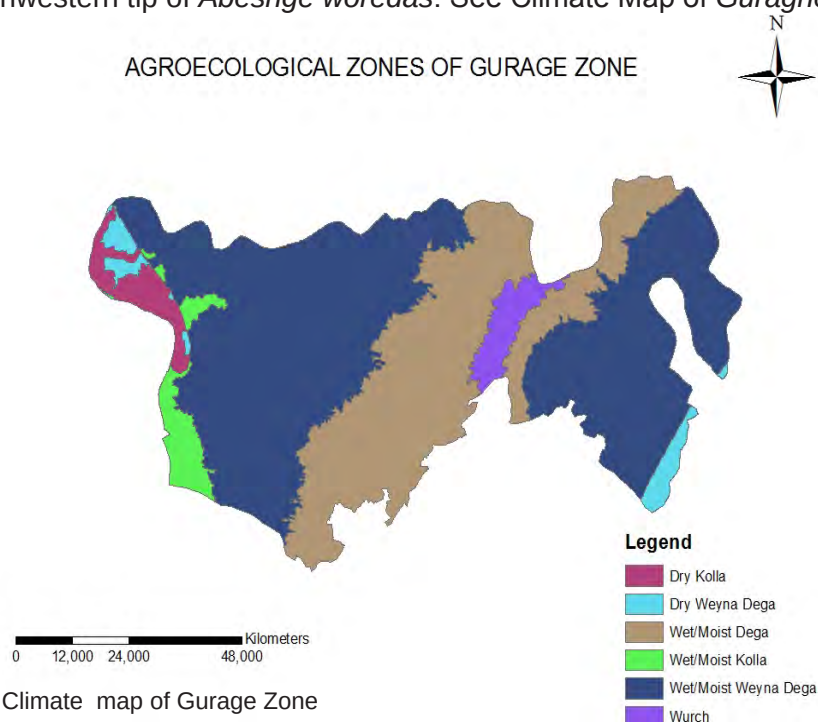


Figure 3.02 Climate map of Gurage Zone

Source, (*Welkite-Gubre* Structural Plan Document, 2010)

b. The Relief Feature of Gurage zone

The relief of *Gurage* zone is classified under western highlands of Ethiopia. It stretches from 1001 meters above sea level in the west up to 3500 meters above sea level in the east. As far as the physiographic division of the zone is concerned from the total land area the largest proportion falls with plain topography. (*Welkite-Gubre* Structural Plan Document, 2010)

Topographic classification	Areal coverage In hectare	Percentage
Plain	342,869.6	57.8
Mountains	182,112.4	30.7
Gorges	38,558	6.5
Plateaus	29,660	5
Total	593,200	100

Table 3.01 : Landform of *Gurage* zone

Source;- Regional Finance and Economic Development Bureau

According to the regional finance and economy development bureau statistical abstract, more than half of the total land area of *Gurage* zone is covered by plain topography. From the topographic point of view, *Gurage* zone has good opportunities for undertake various agricultural activities. From the total areal coverage the share of mountains is 30% whereas plateaus 6% and gorges account the rest 5 percent. And because of the existence of different altitude range, it resulted in the availability of diverse flora and fauna in the zone. (*Welkite-Gubre* Structural Plan Document, 2010)

3.4.4. The Gurage Vernaculars

Introduction

One man's settlement became the nucleus of the future *qaya* (*village*), as his descendants proliferated the *jafwara* with houses and *asat*. These houses were somewhat large in diameter, but the walls were rather low, the average being around one and half meters. The houses had only one door (*wazgab*) and the opening was oval-shaped and consisted of two sets of two vertically placed beams. The inner *wofincha* and outer *atrashiya*, with fitted crescent-shaped wood at the top, the *shir*, and bottom, the *bedar*. Sometimes, because of heavy use, the *bedar* was made of hewn stone. A reinforcement beam, the *wangyiba*, was placed just above the *shir* and was inserted in carved slots as were the other pieces.

Inside the houses were cattle stalls, the *gadar*, which were partitioned by simple posts, the *naqwocha*, reinforced by a horizontal beam, *yakwatamar*. Originally the *gadar* was placed behind the center post opposite the door. Such houses were known as *yohyina*, later on the *naqwocha* were moved to one side as storage needs increased. And typically of village symmetry, all houses on the same side of the *jafwara* had the *gadar* on the same side of the house, with an opposite pattern on the other of the road. A storage area, the *derar*, was

located behind the main plank-fitted partition, the *gwada*. The plank roof of the *derar*, the *kota* kept dust out and served as additional storage space for extra floor mats. In addition, most houses had a large hewn horizontal plank, the *agdata*, which was held in position by two vertically placed posts, the *qaraba*, at each end. The *agdata* was a small partition behind which temporary storage was made. It was the first type of partition to emerge in the evolution of *Gurage* houses, and when storage needs increased and the *gwada* was added, the *agdata* was retained despite its superfluity. In none of these structures were nails used. All assembling were done with rope or notched fittings. As time passes, the houses became more elaborate in their construction and furnishings (Lebel, 1969).

How these people developed such a fine tradition of house construction is somewhat an enigma. But it is certainly one factor that distinguishes them from many areas of the country. The following description of the arrangement and methods of construction should help illustrate this tradition.

Gurage vernacular houses, as with many houses of *enset* cultivating peoples of Ethiopia, are found neatly organized in villages. A *Gurage* village settlement is known as a *qaya*. Settlements are usually found along a continuous line, the *jafwara*, which is the principle avenue of the area. This avenue is quite wide and uniform throughout its length, and not infrequently has a large *zegba* tree somewhere in the middle where the elders often sit to discuss matters of common interest. In all villages, each homestead, *ya at sab bet*, may consist of one, two, or three houses, carefully arranged in the settlement pattern. Surrounding each homestead are rows of *asat*, or *Enset ventricosum*, which is the most important staple of the *gurage* diet and necessary in the construction of their houses. The *asat* field are carefully arranged around the house and their thick green leaves help prevent the spread of fire. From each house to the *jafwara* are walkways of thick green grass known as the *gakata* foot paths, *ema*, connect the house of the *qaya* together.

The maximum number of house types per household is three and consist of a very large, a large, and a medium size. They are respectively the *goye*, *harar* and *zagar*, and are the loci of different activities in *gurage* home life. Diameters of these house range from four to ten meters, with height in equal proportion. The *goye* is used for keeping the livestock, storage of goods, and an occasional place for holy day celebration, or in receiving guest. The *harar* is used most frequently, as the principal house for the family's sleeping quarter (as well as for guests), for eating daily meals, and for common everyday activities. Prime milk bearing cattle are sometimes kept on one side of the house. To maintain property of the *harar*, food is almost always cooked in the *goye*, so as not to create any congestion in the main living quarters. The *zagar* is used for the preparation of *wusa* bread (derived from *asat*), the brewing of beverages such as *arage*, *sahar*, and *tella*, and a periodic gathering place for the village women who meet to collect milk, butter, or other food article in preparation for a major celebration (Lebel 1969).

Details

In the 60's traditional *Gurage* houses, the interior furnishings are numerous and serve a variety of functions. Between the umbrella like structure that supports the roof and the *gwada*

are several separated beams, *zagwira*, on which is placed freshly-cut wood to dry, the height serving as a convenient storage place as well as providing maximum exposure to rising warm air. In front of the *acba*, or center-post, is a circular fireplace, the *mijaca*. It is rimmed with cow dung and clay, or, in wealthier men's house, of stone. The rim is called the *gadarat*. In the center of the *mijaca* is a small pottery bowl, *tinkiya*, which prevents coals from dying out completely, especially during the night. Cooking on the *mijaca* is facilitated by the use of three clay pot supports, known as *gonziya*.

The floor is disinfected by adding water and cow dung, which gives the appearance of a smooth green matted floor. The contrast between the black painted fireplace ring and the base of the *ac'ba*, is quit striking. Woven *asat* mats are placed in different part of the house and are identify by their location. *Yaac'bejipa* is especially designed to fit around three side of the *acba* and conform to the edge of the *mijaca*. *Yofincegipa* is contoured to the opposite side of the *mijaca* and extends over to the door *Yofincegipa* fill the gap between the other two next to the *mijaca* on the right or left side and extends over to the wall. A space, *yarefte*, is left barren between the cattle-stall and the *acba* because of the frequent movement of cattle in and out of that side of the house and its use as a feeding area for the cows. Cow dung plaster walls are frequently left plain at the bottom and whitewashed from midway to the top with a local lime, *wabara* (Lebel 1969).

Three types of seat are to be found in the *Gurage* household, the *tagasha* the *burcema*, and the *qwanta*. The first is circular wooden disc. The second is a three-legged stool. Two kinds of *burcema* have emerged, the older with free standing legs, the more recent with vertical supports from the seat to the leg bases. The *qwanta* is a two-piece seat that is assembled by placing the peg projection of the back into the hole in the seat.

Pottery decorates the upper parts of the wall and is hung in a horizontal line. Meals are served in pottery, either on a two-toned *asat* mat, *yawadara*, or else on a reed basket, *yawadarapwa tabara*, with carved horn spoons, *yawarapwa anqafo*, for eating and *yarasapwa anqafo*, for serving. When roasted grains are served or *asatwiisa* bread is served, a conically-shaped basket with a bowl top, *saf*, is used.

To protect the household from night time thieves and hyenas, a woven reed transportable door, *wazgab*, is placed in the doorway. Two vertical posts with holes bored in them, the *macma*, are placed on each side of the doorway. Horizontal beams, *umwa*, are inserted in the holes of the *macma*. Thus locking the door into position for the night. This would not deter an obstinate thief and one could always dig under the door. This practice has disappeared in recent years, however, and no longer constitutes a threat. In the day time, a shorter reed door, *yofinchatabar* is placed in the doorway to reduce wind and to discourage stray dogs (Lebel 1969).

Variations

Historically there have been certain modifications in the construction of *gurage* vernacular houses. Many years ago, when there were no eucalyptus forests from which to draw construction materials, people built their house almost entirely from *dat* (*juniperus procera*), *zagba* (*podocarpus gracilior*), *gwaraba* (*syzygium guineense*), *Wankisa* (Amharic *cocho*), *inet* (*Arundinaria alpina*), *deya* (palm), *wurbe abta* vines and *wadara* (*asat* dried-leaf rope).

Today, (in late 1960's), most houses have two doors. The second door support, the *atrasiya*, is disappearing and is being replaced by a wider, sturdier *wofincha*. Furthermore, the transportable door has been replaced by a hinged door, and the *shir* and the *bedar* have been made entirely horizontal to fit the contours of the door. Walls have become taller, to heights of three meters in many houses, which permits greater illumination. Instead of cow dung plaster on the walls, most houses are now built by using mud with straw, for greater durability. The two tone color pattern has disappeared along with the old plaster and walls now have solid white wash, often with lime brought from Addis Ababa. Windows have been seen with increasing frequency, particularly in houses that the proprietor intends to rent or in house where an educated member of the family has exerted his influence. Most of the wood in today's house is eucalyptus, both red and white, and reflects the ubiquity of the tree in rural areas of Ethiopia.

With greater communications, rising prosperity has caused many families to dispense with local pottery in favor of imported glassware from Addis Ababa. The same pattern is true with wooden furniture, and standardized wooden tables and chair are found with increasing frequency. But most unusual is the small but growing number of houses that have cement floors. Finally, the erosion of village security has resulted in the erection of many tall imposing fences around compounds for protection (Lebel 1969).

Construction

The actual construction of a *Gurage* vernacular house is as follows. The owner first spends considerable time in collecting materials for the house. This includes a large timber for the *acba*, bamboo strips for the outside, split planks for the wall, thin saplings for the roof, and shaped *wofincha* beams with a carved seam in the outer edge to hold the bamboo. Formerly these materials could be obtained from the owner's own forest land, but increasingly dense settlement and dwindling supplies have forced men to cash remittances in order to provide the necessary supplements. The amount of time involved from the time the owner decides to build his house until the construction actually begins may be as long as three years, depending on the facility with which he obtains the necessary materials. Construction time may only consume one month, and is usually begun after planting season, which is just before the principal rainy season, or just after the rains. Labor is supplied by village workers, who reciprocate voluntarily each time a local resident wishes to build a house. The number of workers involved in the construction of a house ranges from five to thirty (Lebel 1969).

As the construction time approaches, the owner terraces off his land with his *asat* digging stick, the *marasa*. A construction foreman, the *kana*, supervises the preparation of the materials as well as the stages of building. The *kana* is skilled in chopping and shaping the fine details of the *wofincha* and the *acba* that specialized wood craftsman have prepared. The diameter of the house is determined by placing a stake where the *acba* is to be sunk, and marching toe to toe to a satisfactory radius. Each foot-measurement is known as one *jef*. Once the limit has been determined, the village workers who have assembled to assist in the construction tie together dried *asat* leaves in to length of rope, *wadara*, which will eventually

make one rope the same length as the prescribed radius. A circle *tabab*, is then traced by marching around the stake with the *wadara* stretched outward. Village workers then dig a trench in the *tabab*, in to which are placed split timbers of red and white wooden that will form the wall. These outward-leaning timbers are then known as *gordara*. The *gordara* is fastened together by attaching horizontal strips of split bamboo (or finely hewn strips of red eucalyptus when bamboo is not available) with *wadara* rope and *abta* vine in vertical rows. The outside horizontal wooden strips are known as *gwala*. Together, the *gordara* and *gwala* are known as *yafar bet*.

After this first stage of construction has been completed, the workers begin assembling scaffolding that will permit them to attach the *acba* and the roof. The scaffolding is known as *kotakot*, and consist of Y-shaped beams that are fastened together with *wadara*. The main pressure point of the *kotakot* will be against *yafar bet* so as to retain its circular shaped in the later stages of construction when workmen will be climbing the roof. The *acba* hole, *yaacba gwodja*, is then dug and the bottom is lined with stone so as to prevent sinking once the center post has been erected. Workers then tie *asat qanca* rope around the *acba* log and drag it into the house through the door so as to form a perfect diameter. Since the length of the *acba* must conform to the diameter of the house, necessarily adjustments are made at this time. Then with men on the *kotakot* pulling the *acba* up with ropes as men on the ground push up with cross beams and Y-shaped wedges, the workers all joint in choruses of yelling and cheering as they struggle to raise the *acba* up to the level of *yafar bet*, and, finally placing the end in *yaacba gwodja*, pull the other end over to the center until it is perfectly vertical. This feat usually shows that the greatest struggle has been completed and is often marked by the slaughter of a bull, sheep, or some other animal, and all the workers joint in a feast (Lebel 1969).

Little time is spent in feasting, however, and workers soon prepare for the construction of the roof. First *wutara* are evenly spaced in vertical arcs so as to form a dome-shaped roof. The space between each *wutara* is about thirty centimeters. To preserve the dome shape, *wadara* rope is attached from the lower ends of *wutara* to *yafar bet*. This *wadara* is known as *yeotara wadara*. Then horizontal strips of split bamboo, the *zapa*, are attached from the inside to the *wutara* with *wadara*, thus giving the roof skeleton the appearance of a large fish net. To reinforce the roof, split strips of wood of various length and width, *zarabu*, are attached with *wadara*, to the space between each *wutara*. The roof frame is given additional strength at the *acba* joint by interlacing *abta* vines. This reinforcement is known as *yenbet*. The attachment of the lower roof frame to *yafar bet* is also done with *abta* vines, and the joint is known as the *dimwamwat* the house then take on a new name, *yaskur bet*, and is no longer *yafar bet*.

At this point, skilled wood craftsmen shape a niche about three-eighths up the length of the *acba*. Thick vertical beams are then hewn to fit smoothly around the *acba*, and the projected out toward the roof, much like the support of an umbrella. The vertical beams are called *waka*. To prevent the *waka* from breaking through the roof frame, a cross-piece known as *dangasa* is attached to the end, resulting in a T-shaped vertical support. The *waka* is made sufficiently long to maintain the dome shape of the roof, even after the *yeotara wadara* has weakened. Throughout these stages of construction, the village workers periodically take breaks during which they are supplied with coffee, roasted grains, drinks, and the latest gossip.

Next comes the thatching of the roof. Most of the workers no longer continue building at this stage, as thatching requires only two or three men. One man on the ground ties dried grass, *caza*, into bundles and tosses them up to the Thatcher, *yahadiriya*, who support himself by *wadara* rope tied around his waist and fastened to the top of the *acba*. Thatching being the bottom and is done in a spiral pattern toward the top. To prevent the *caza* from being drawn too closely to the frame as well as from falling down from the roof, *yahadiriya* will first attach horizontal wooden strips of bamboo on the outside. These strips are known as *gisagad*. Further reinforcement, *tataba*, is placed horizontally under the *entranceway*. Once the top thatching has been completed, *yahadiriya* frequently adds extra thicknesses of grass around the *acba* and secures it with *abta* vines so as to prevent leaking during the rains. To prevent cracking of the *acba* at the top, a pottery bowl, *ya acbagara*, is placed vertically over the end. *Ya acbagara* is not made especially for the *acba* and usually a pot that has cracked. It has no ritual value and is a purely practical addition to the house (Lebel 1969).

The completion of the thatching marks the end of major construction of the house. The owner will then concentrate on the interior furnishings. Many times, the *waka-dangasa* is first only a temporary structure, in which case it will be replaced by thicker beams that are more durable. Once this has been completed, the *kotakot* is removed and the ground is turned over in preparation of the floor. Vertical partition posts, *benä benya*, are put in to position to determine the size and location of the *derar* and *gwada*. A horizontal beam, *yakwatamar*, is placed on the top of the *benä benya*, and vertical planks are attached in the final stage. If the rains have been sufficient, the owner is ready to dig a hole outside the house where he will add straw to allow fermentation of the mud wall. Two throws of mud are added, the first being allowed to seep well into the seams, and then to dry out sufficiently to crack. The second throw, with a higher proportion of straw, will adhere well in the cracks of the original mud. Depending on humidity conditions, as soon as time permits, the owner will add whitewash to the dried mud. Doorstep stones, *yofinca imar*, are placed in a cleared outside door space, the *waradja*. Then, with the preparation of the floor and the emplacement of the *mijaca*, the owner can look back with pride at his completed house (Lebel 1969).

Factors of Variations

The precise detail involved in the construction of the *gurage* house is obvious. This accounts for the high quality of the house as well as their duration. Many houses last for fifty years or longer, if made with sufficient quantities of red wood (necessary to prevent a termite feast), and require a new roof thatching only every ten or fifteen years. They are cool in the daytime and warm at night, thus providing an ideal house for living in the tropical weather of Ethiopia. The high wall and roof allow smoke to rise up quickly through the roof so that ventilation is never a problem. Yet these houses are facing extinction in the near future. The principal factors involved are the expense and the exhausting effort required to construct them. A further drawback is that as village security breaks down, the cost of building the *seour* bet is likely to increase, since the owner will be under increasing pressure to offer direct monetary emolument to the workers. Finally, there is the possibility of fire. With such a heavy investment involved, today's owner is scrutinizing more and more the risks incurred in building a fine

vernacular house, only to have it turn to ashes (Lebel 1969).

Taking cases in number of locations of the study area; through detailed and in depth study of house units, compounds and settlements in terms of their physical and spatial aspects, the next chapter of the thesis will expose the current situations.

PART IV: CASE STUDY AND ANALYSIS



Figure 4.01, Case Location Map of *Gurage Zone* to *wereda* level (EMA and overlays).

Sub topics:

4.1. Introduction

4.2. Case Study and Analysis

4.3. Cross Case Analysis

The above three sub-topics structures this part of the paper, in such a way that, in the introduction part it describes pattern of the case study and how the cases explored and studied. The second sub topic focuses on the discussion and description of cases in different level and components in analyzing each case in detail. In cross case analysis it discusses the summary of all analysis in each case as a whole.

4.1. Introduction

As it is discussed in part II of the paper, this research is undertaken in applying mainly case study research method.

In order to answer the research questions and achieve the objectives of this thesis cases were selected from *Gurage* zone. Six cases were selected from six *weredas*, out of thirteen, to reinforce sample representation. This chapter looks in to all cases in settlement, compound and house unit level. Respecting this, the following discussions are structured in such a way that, it gives an introduction of a general background to the *wereda* of the case location after which, discussion and case description in settlement level follows which encompasses randomly selected compounds and house units. In this paper the physical and spatial aspects of the cases are exhausted, while, using relevant information on social, cultural and economic issues which are directly or indirectly linked with the scope of this study.

Six village settlements are included in the study, following the introduction of their respective *weredas*. All cases are presented as a package having all the three components in separate subtopics, so that, it will create a meaningful pattern based on context. Priority is given to village settlements in giving text description and graphical representation of the study area. Next to a description on village settlement it continues to the second component which is compound, for this component three samples from each case are discussed, two of which are annexed in back pages, in their respective case locations separately, so that it gives a complete description about compound in its case location. Same pattern of presentation is followed in house unit component in discussing three samples of house units from same case location which again give a complete description of the component in its respective area.

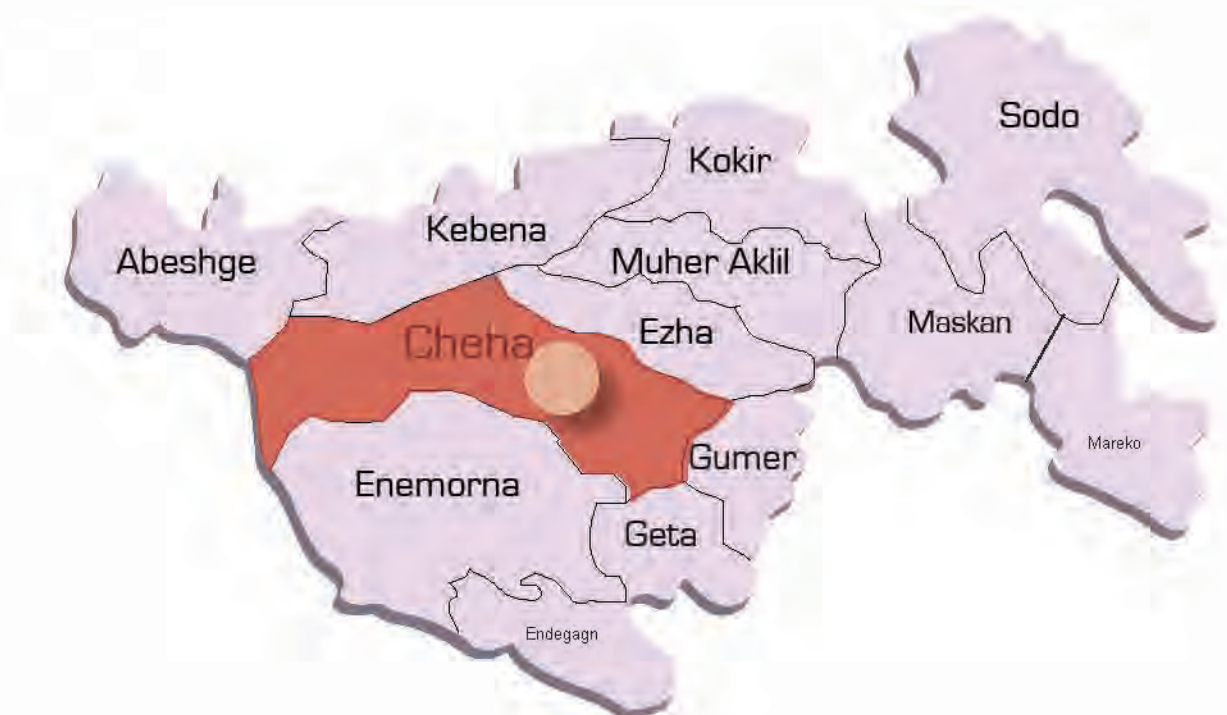
Following text descriptions, maps are used to show location of the components, specifically Google map is used as a tool in locating all the three components. Following, physical and spatial mappings presented in line with pictures and images showing details of the respective components.

NOTE: Because of page number limitation one sample is presented both from compound and house unit from each case. But the rest of the samples are annexed in the back pages which includes two compounds and two house units from each cases.

4.2. Case studies and Analysis

4.2.1. Case One : Cheha Wereda (Close to Emdibir town)

Cheha wereda is one of the thirteen administrative *weredas* of the *Gurage* zone. Its capital town is located around 185 km from the capital city of Addis Ababa to South West direction. The *Wereda's* main town is *Emdibir* which is around 30 km from *Welkite* which is the zonal capital town. The *Wereda* covers around 44,072 hectare land of the zone. Its altitude ranges from 1200m to 2600m above sea level. The population is around 115,918 of which 8,985 lives in towns and 106,933 lives in rural areas (CSA, 2007). The climatic condition ranges from *Dega* to *Weynadega*.



Settlement I: Berashzi Village settlement (Yeweshz)

Berashzi Settlement is located to the West direction from *Emdibir* town, at a distance of 4.5km. Based on the interview with Ato Yimam Ahmed, who is one of the elders of the village, this settlement was started in the generation of his fifth great grandfather, whose name is *Denebo* and it is estimated to be more than 200 years back. The settlement is located adjacent to a small river called *Gogos* where the community uses the water for their cattle, cleaning purposes like washing their clothes also taking bath and they also fetch water from this river for Domestic activities like cooking.

The main avenue (*jefwere*) of the settlement is located on top level of the folded ridge like topographical formation. Following the *jefwere*, compounds are organized linearly having various house units clustered within and a long backyard ,which terminates naturally blocked by a river and forest. Though this settlement is located near town they still don't get clean water and electricity (while watching the line passing through their *jefwere*). A road which take from *emdibir* to *burat* and connect to *quante*, passes crossing this settlement by splitting backyards of compounds of some households in the settlement. This road also pass through *jefwere* of the next settlement to the West direction which is called *Girar Dibir*. In this settlement there are around 27 households.

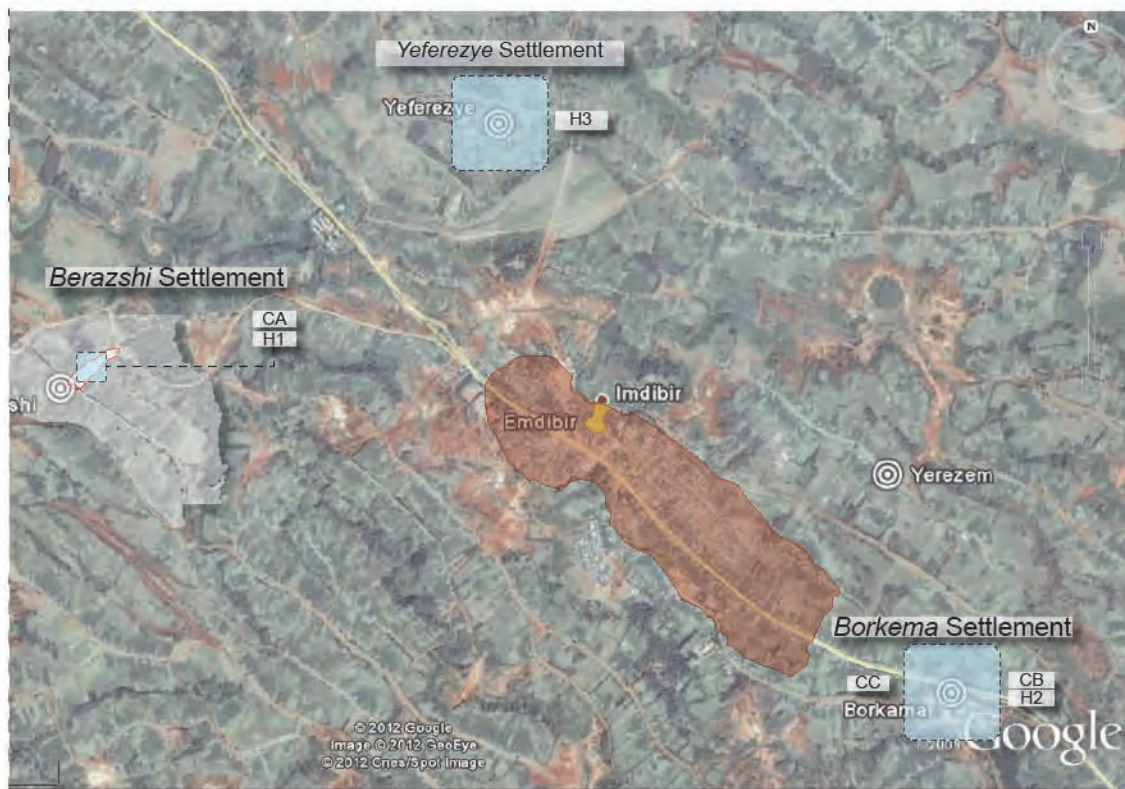


Figure 4.03 Location map of case one settlements, compounds and house units (Google Earth + Overlay)
 Legend: CA- Compound A H1- House unit one



Figure 4.04 Berashzi settlement layout (Google Earth + overlay)
 Legend: ■ - Rectangular house units ● - Traditional house units ■ - Single Compound

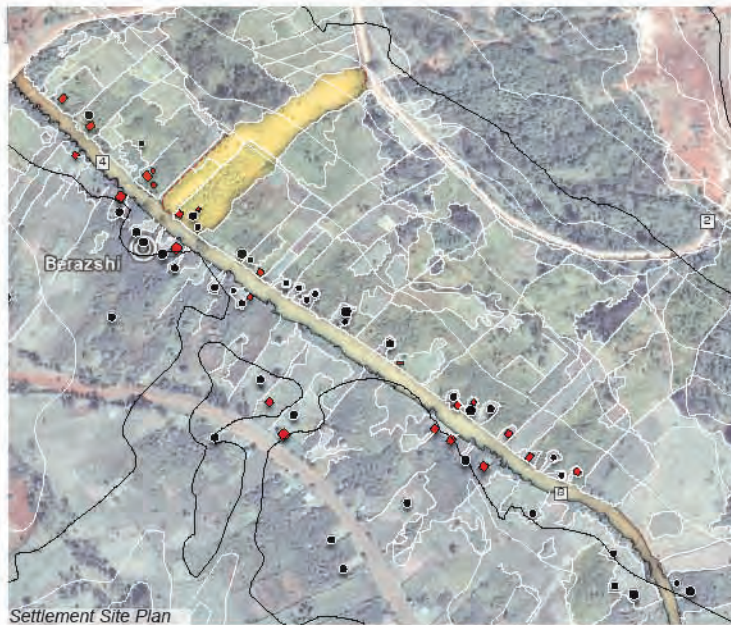
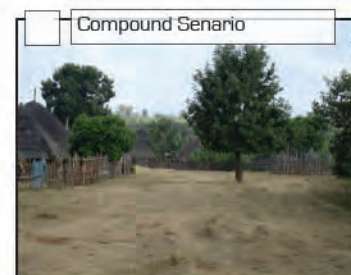


Figure 4.04.a.

Berashzi settlement, infrastructure and activities (Google Earth + overlay and own pictures)

Legend:

- - Rectangular house units
- - Traditional house units
- - Compound A



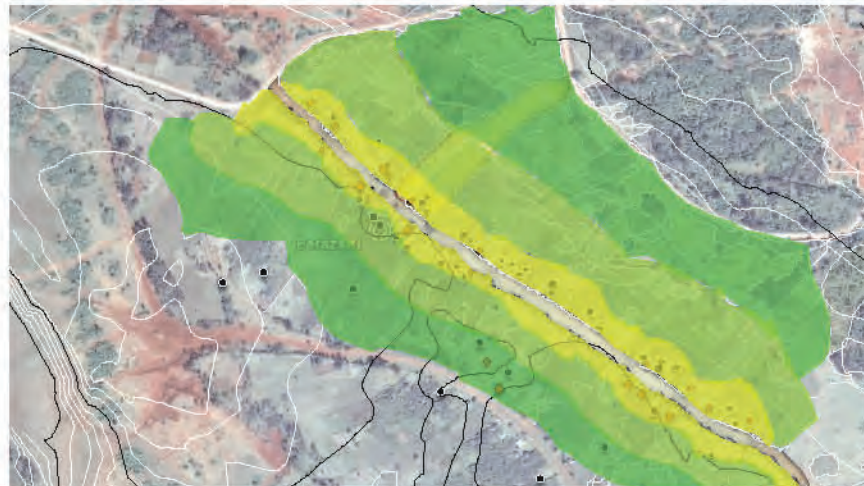
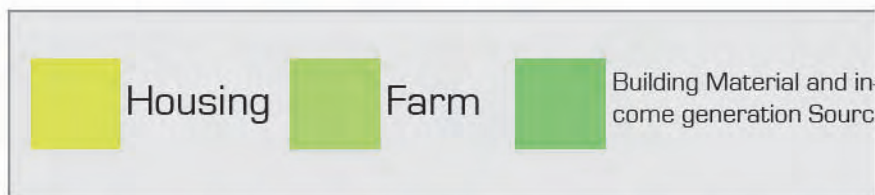


Figure 4.04.b. Land use
(Google Earth + Overlay)



Figure 4.04.c. Topography
(Google Earth)



Figure 4.04.d. Topographic
Cross Section



Figure 4.04.e. Partial 3D view
of the settlement.

Case 1
Compound A
Owner Yimam Ahmed

Number of houses 5
Front size of compound 70 m
Compound type 'private'



Compound: A

Ato Yimam Ahmed was born in this settlement in 1945. He got his land from his father. He has 6 children, 3 male and 3 female and 2 of them live in Addis working in business sector. In Ato Yimam's Compound there are five house units, of which two of them are the traditional *goye* and *herar* having the circular layout in plan and roof cover of thatch. Two rectangular shaped layout covered with Corrugated Iron sheet and serves as guest house, store, children room and mosque. One kitchen having squared layout in plan and covered with thatch roofing. In the back yard of the house units there is an immense portion of land of his compound which is used for farm. This land is parceled for various types of plantations like *enset*, vegetable, Fruits, coffee, *chat*, thatch, Eucalyptus and others which he uses them for domestic consumption, income generating, fuel consumption and as construction material. The size of the plot of his compound is one *wedero* which is around 72m at the front and it extends to the river on the other side. He has his own water well in his compound which also serves his neighbors. They use the water for cleaning and cooking activities. His compound is defined with strongly constructed internal and external fences by using splits of eucalyptus pole and sharpened at the tip and the housing unit having the *enset* plantation at their background. He uses a latrine pit as a toilet which is located in the back yard.

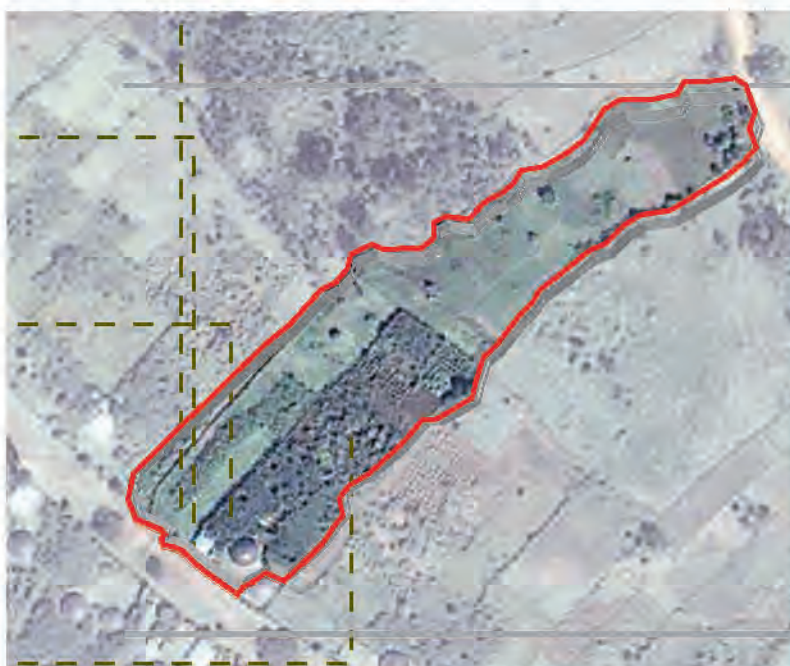


Figure 4.05 Site Plan of Compound A
(Google Earth + Overlay)

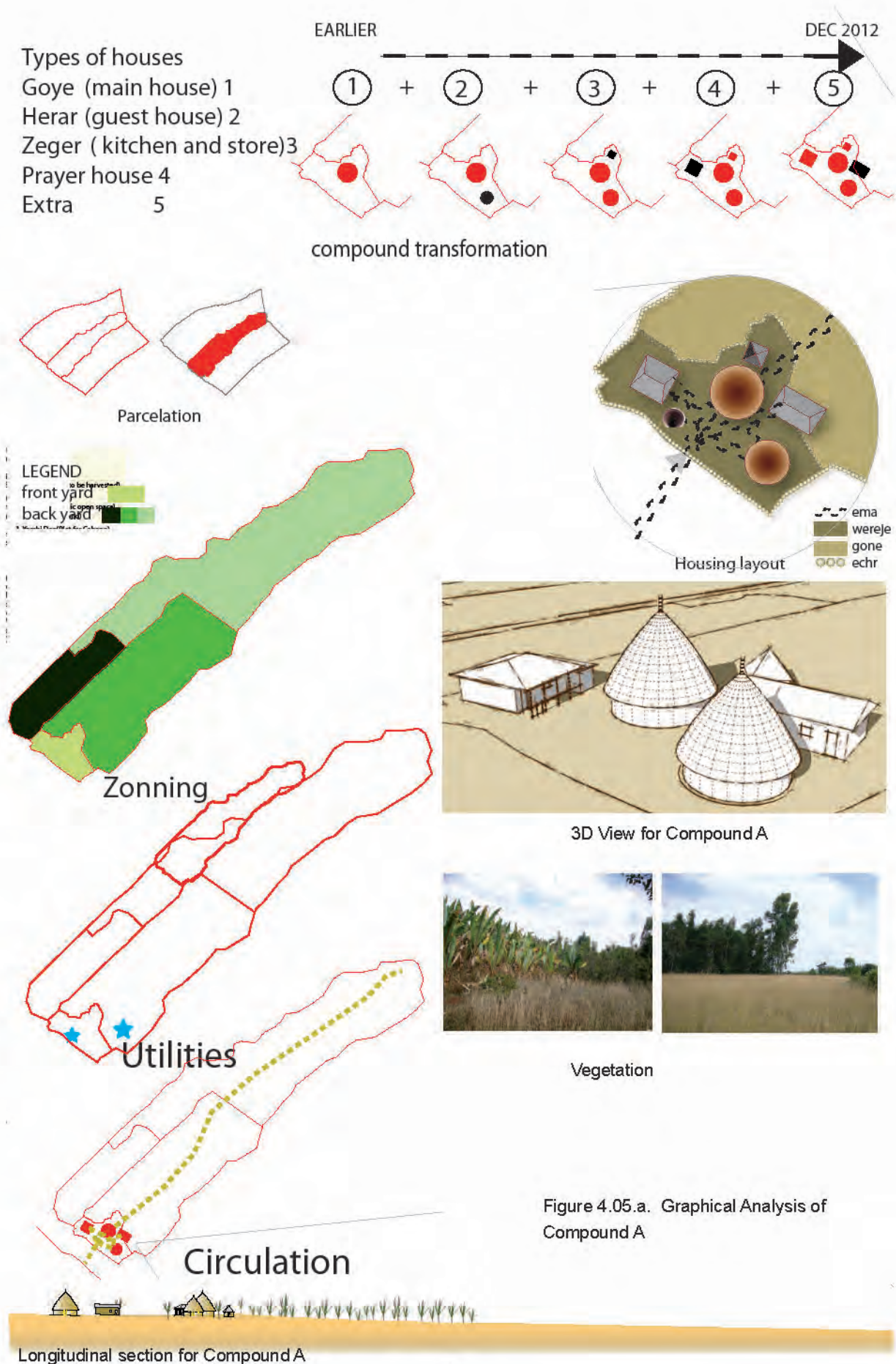


Figure 4.05.a. Graphical Analysis of Compound A



Footpath through backyard



Backyard Enset Processing



Frontyard Partial View



Ground Water Well

Figure 4.05.b. Pictorial analysis of Compound A (Own Pictures)

House Units: 1

Ato Yimam Ahmed as details expressed in compound A; He has five house units, the main house (*Goye*), the guest house (*Herar*), Kitchen and Store house (*Zeger*), Mosque, additional Children and storage room. Of all, the *Goye* is the old one which counts 21 years since it has been built and the rest are 17, 15, 10 and 2 years respectively. When he builds the mosque it was suggested by his children to have a double purpose, in addition to its service for prayer it can also serve as a guest house whenever there is special occasion; and whenever they come home they prefer to be in the mosque unit as he explained.

His main house (*goye*) has a circular layout and a roof cover of thatch. At the entrance of this unit there is a big portion of space of the house which he uses for socializing, taking rest and sleeping in addition to the coffee ceremony and dining services. At the center there is a central post with its radiating struts supporting the roof system starting at one third of the post length from the bottom, in front of which there is a fire place which is not usable but just a cultural symbol. Behind the central post there is a wooden partition with a height of one fore arm length shorter than the perimeter-wall height, which segregates the multipurpose space from the storage, wide circulation space and cattle unit. The circular guest unit, having similar character with the main house and supporting some functions of the main house like, barn and storage, it serves as children sleeping and study room till there comes a guest. A small squared layout unit, replacing the traditional circular *zeger*, serves as a kitchen for cooking purpose, which is constructed using wooden wall and thatched roof. The mosque is the only unit finished with cement screed floor finish having rectangular layout and covered with corrugated iron sheet. The newly built rectangular unit is on the stage of completion of wall cladding. It has two rooms for the purpose of additional storage and providing male and female children their own units, where the boys are using the mosque unit as a sleeping space for the moment.

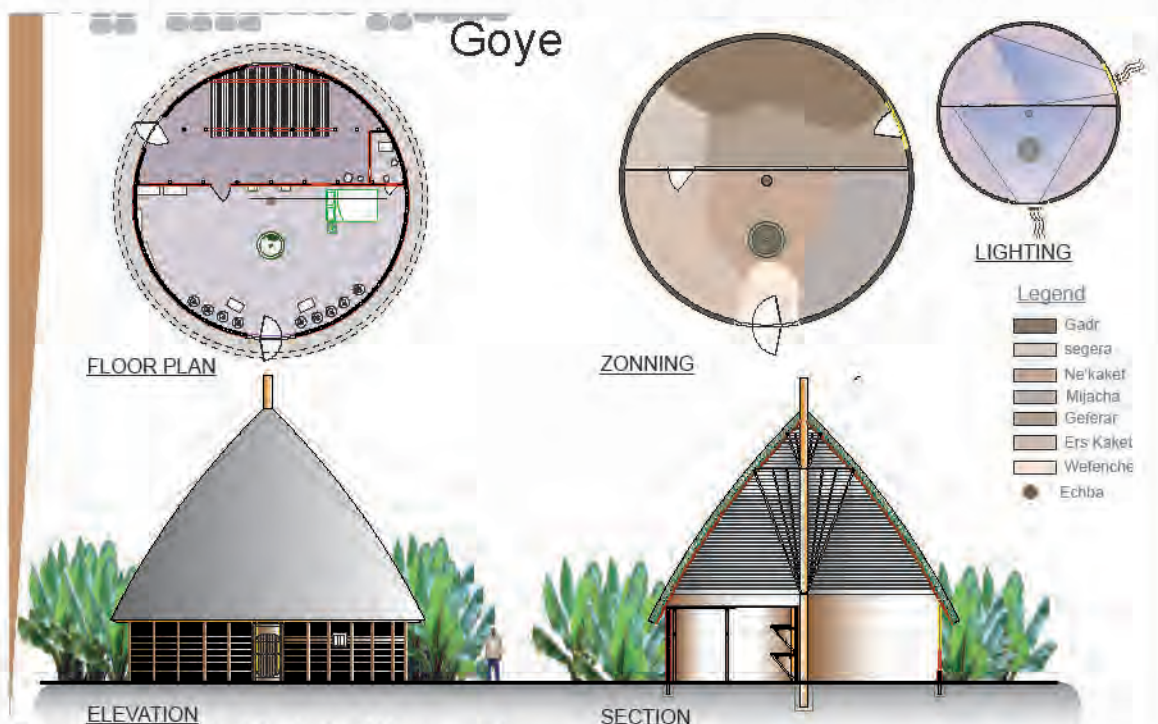


Figure 4.08. Graphical Analysis of House unit 1

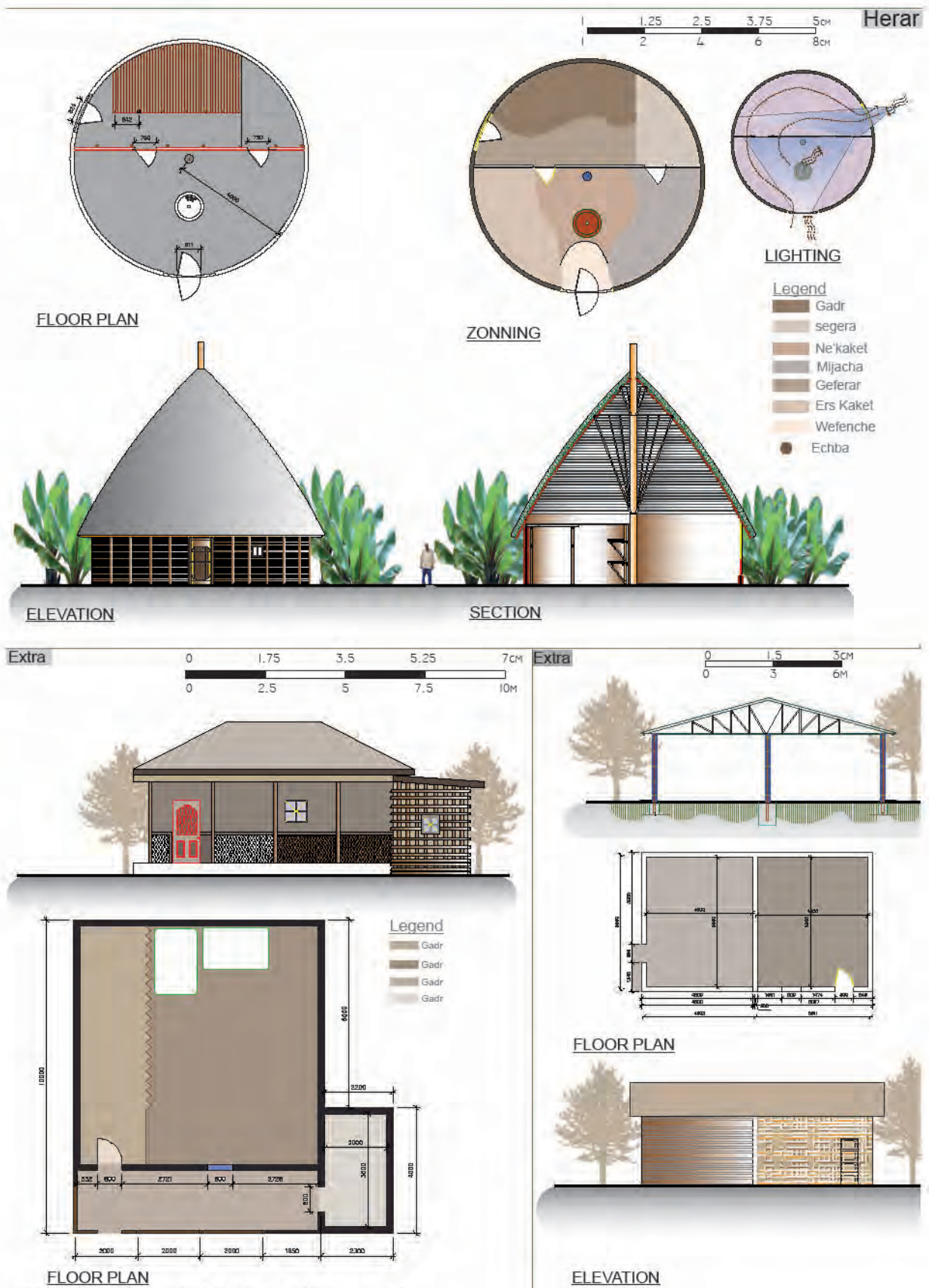




Figure 4.08.b. Graphical and pictorial Analysis of House unit 1

Plat Form of filters for Analysis

Multiple levels and details of filters are used to analyze primary and secondary data of the study in looking for refined findings seen in various lenses and perspectives. The following are lists of filter in their respective component.

Filters used in settlement analysis

- Availability of Infrastructure and services
- Intervening Elements
- Nature of topography
- Starting generation
- Distance from center of nearby town
- No. of house units and their types based on Google map image in its respective image date

Filters used in Compound analysis

- Number house units
- Front size
- Ownership
- Number of household
- Fence condition
- Source of water
- Source of energy
- Availability of latrine pit
- Types of house units based on purpose
- Usage of backyard

Filters used in House unit analysis

- | | |
|---|------------------------------------|
| • Shape and roofing | • Number of doors |
| • Wall connection | • Number of windows |
| • Roof connection | • Floor Finish |
| • Structural connection | • Internal Wall finishing material |
| • Income source of the household head | • External wall finishing material |
| • Accessibility of thatch | • Window and door material |
| • Accessibility of traditional builders | • Size |
| | • Condition of Partition |
| | • Usage of front fire place |

Analysis at Emdibir

Settlement Berashzi

Availability of Infrastructure

Gravel Road	Electricity	telephone	Clean water	Health post	Religious center	school	cemetery	Mill house
√	√	x	x	x	√	x	√	x

Intervening elements

Gravel Road	Electric lines	Communal Water Sup.	School	Kebele Office	Town Expansion	Irrigation channel
√	√	x	x	x	x	x

Nature of topography

Plain	Partially folded	Fully Folded
-	-	√

Starting generation

Current (First)	Second	Third	Fourth	Fifth	Sixth	More
-	-	-	√	-	-	-

Distance from center of nearby town /Km

0 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6
				√	

No. of house units based on Google count (imagery date of Nov 6, 2006)

Thatch Circular	CIS Circular	CIS Square generated	Thatch Square generated
34	x	15	6

Table 4.01. Analysis of Settlement 1

Compound analysis in case one

Number of house units within a compound

Quantity	One	Two	Three	Four	Five
Percentage	7%	22%	50%	7%	7%

Front size of a compound in wedero

Size	Two	One and half	One	Half	Less
Percentage	-	29%	50%	21%	-

Owner Ship of a Compound

Owner ship	Private(single household)	Shared(multiple household)
Percentage	71%	29%

Fencing type

Type	None	Simple	strong
Percentage	7%	36%	57%

Number households within a compound

Quantity	One	Two
Percentage	71%	29%

Availability of latrine pit

Availability	Available	Not available
Percentage	100%	-

Usage of backyard

Usage	(A) food source	(B) income source	(C) material source	A & B	A & C	A,B & C
Percentage	0%	0%	0%	7%	29%	64%

Source of Energy

Sources	Wood and Kerosene	Electric and wood	Solar and wood
Percentage	64%	29%	7%

Source of Water

Source	(A) Pumped water	(B) Ground water	(C) River	A and C	A,B & C
Percentage	-	-	-	86%	14%

House unit Analysis of Case One

House unit types in a compound based on purpose

House types	Goye	Goye and Herar	Goye and Zeger	Goye, Herar and Zeger	Goye, Herar, Zeger and Extra units
percentage	7%	14%	22%	43%	14%

Shape and Roofing types

	Circular and thatch	Circular and CIS	Rectangular and thatch	Rectangular and CIS
Goye	98%	2%	-	-
Herar	14%	29%	-	57
Zeger	28%	-	29%	43%
Extra Unit	14%	-	7%	79%

Wall Connecting Material

	(A) Nail	(B) Rubber	(C) Wedere	A&B	A&C	B&C	A,B&C
Goye	29%	-	14%	-	57%	-	-
Herar	43%	-	28%	-	-	-	29%
Zeger	36%	-	21%	-	14%	-	29%
Extraunit	86%	-	-	-	14%	-	-

Structural connection method

	Only nailing	Rope, groove and socket	Others with nailing
Goye	-	100%	-
Herar	50%	21%	29%
Zeger	36%	14%	50%
Extra unit	93%	-	7%

Income Source of a household

sources	(A) Children support	(B) farm	(C) Farm & business	A&B	A&C
percentage	-	14%	36%	29%	21%

Usage of front fire place in goye

Frequency	Intensive	Occasional	Seldom	Never
Percentage	36%	43%	7%	14%

Resource Accessibility

	Easy	Medium	Difficult	No
Thatch	21%	29%	50%	-
Local builder	21%	43%	36%	-

Number of doors

	One	Two	Three	More
Goye	21%	29%	21%	29%
Herar	21%	40%	32%	7%
Zeger	100%	-	-	-
Extra unit	7%	7%	-	86%

Number of Window

	One	Two	Three	None
Goye	7%	21%	29%	43%
Herar	15%	38%	31%	16%
Zeger	14%	-	-	86%
Extra unit	-	20%	80%	-

Floor Finish material

	Traditional matt	PVC matt	Cow dung screed	Cement screed
Goye	93%	-	7%	-
Herar	14%	21%	36%	29%
Zeger	-	-	100%	-
Extra units	-	7%	7%	86%

Internal wall finish

	Mud plastering	Painted	Cow dung plastered	None
Goye	-	50%	50%	-
Herar	15%	54%	31%	-
Zeger	36%	-	-	64%
Extra unit	21%	62%	17%	-

External wall finish

	Wooden	Bamboo	Mud plastered	painting
Goye	93%	7%	-	-
Herar	43%	21%	7%	29%
Zeger	71%	29%	-	-
Extra unit	-	-	50%	50%

Window types

	Wooden	Wooden frame with glass	Metal frame with glass	Bamboo	None
Goye	64%	-	-	36%	-
Herar	64%	-	7%	29%	-
Zeger	-	-	-	-	100%
Extra unit	100%	-	-	-	-

Door type

	Wooden	Wooden frame with glass	Metal frame with glass	Bamboo
Goye	100%	-	-	-
Herar	64%	29%	7%	-
Zeger	57%	-	-	43%
Extra unit	14%	50%	36%	-

House unit size in diameter or equivalent

	10 to12m	8to10m	6to8m	4to6m	Less than 4m
Goye	36%	64%	-	-	-
Herar	29%	21%	43%	7%	-
Zeger	-	-	21%	29%	50%
Extra unit	-	86%	14%	-	-

Conditions of Partitions

	Fully	Partially	Fractionally	none
Goye	-	93%	7%	-
Herar	50%	14%	7%	29%
Zeger	-	-	-	100%
Extra unit	-	100%	-	-

4.2.2. Case Two: Gumer Wereda (Close to Arekit town)

Gumerwerda is located in the southern part of *Gurage Zone*. The capital town of *Gumer wereda* is *Arekit*, which is 220 km from Addis Ababa and 65 km from *Welkite*. It is composed of 18 rural *kebeles* and one town. Its topographic feature is categorized in an unevenly folded landscape (mountainous). The *wereda* covers around 23,555 hectare of land within which a population of 84,884 lives (CSA, 2007). 95% of the population lives in rural areas and the rest 5% lives in towns (CSA, 2007). The population density is 245 per square km. The altitude ranges between 2100 and 3000 m above sea level. The climatic condition ranges from *Dega* to *Weynadega*.



Figure 4.11. Location map of Case two: Gumer Wereda (EMA + Overlays)

Settlement II: *Eguraguazer Village Settlement*

It is located near *Arekit* town struggling with the town's urban characters in keeping its originality. It is situated just at the southern part of the town, branching its *jefwere* from the main road which takes to the next town *Kebul*. The *jefwere* takes the top elevation of the topography of the settlement. There are around 24 households in the settlement. One elementary school is situated at the end of the settlement to the West. Compounds are organized respecting the traditional open space and avenue respecting its linearity. One side of the settlement is being intervened by the town, trying to make this settlement part of it, from the backyard end of compounds by taking land from dwellers. As one of the house hold head explained, when they complained to the authority the reply was that, "*this is for the development of the town and so you need to be supportive for the government plan.*" So, with this answer they could do nothing but silence; knowing that a piece of land meant a lot, as he explained, their life is highly based on their land and they consider the pain, as if it is cut out from part of their flesh. Electricity is being provided since few years back to this settlement.

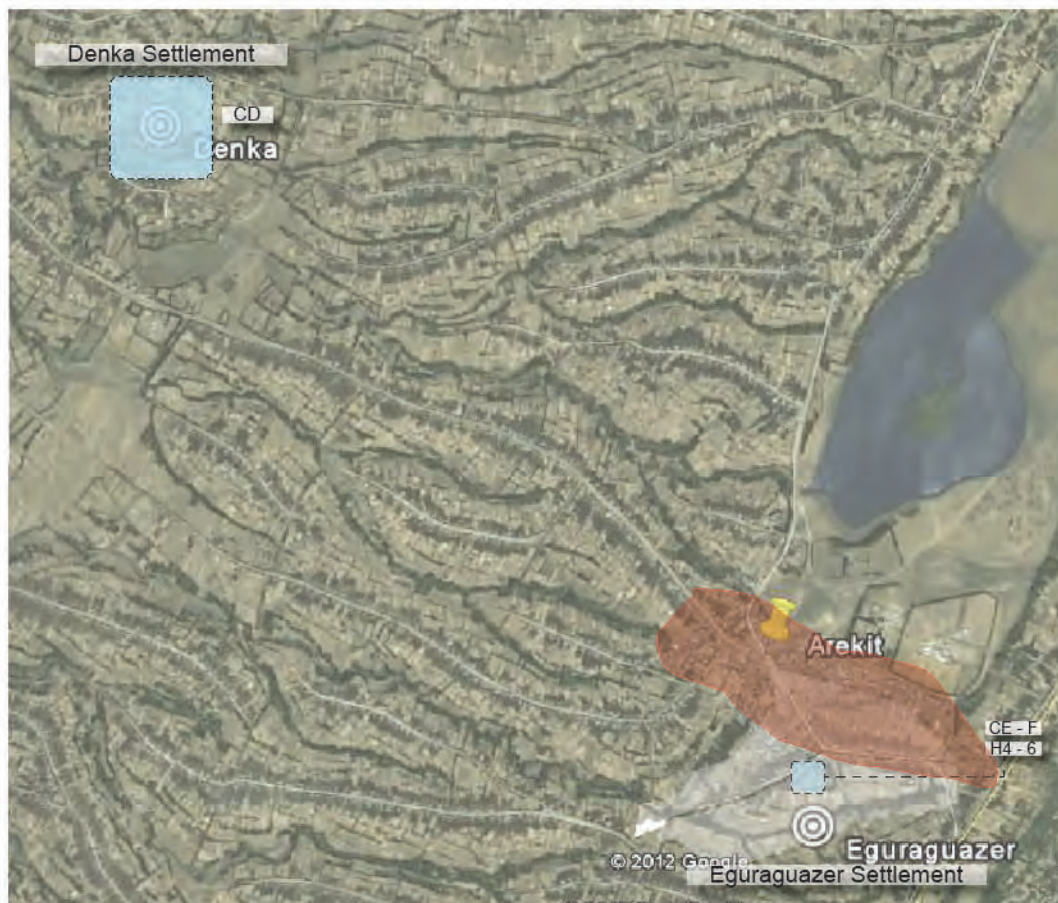


Figure 4.12. Location map of Settlement two (Google Earth + Overlays)

Legend: CD- Compound D H4-6 - House unit four to six



Figure 4.13 Layout of Settlement two (Google Earth + Overlays)

Legend: ■ - Rectangular house units ● - Traditional house units ■ - Single Compound



Figure 4.13.a. Pictorial analysis of Settlement two (Google Earth + Overlays and pictures)

Legend:

- - Rectangular house units
- - Traditional house units
- - Compound A

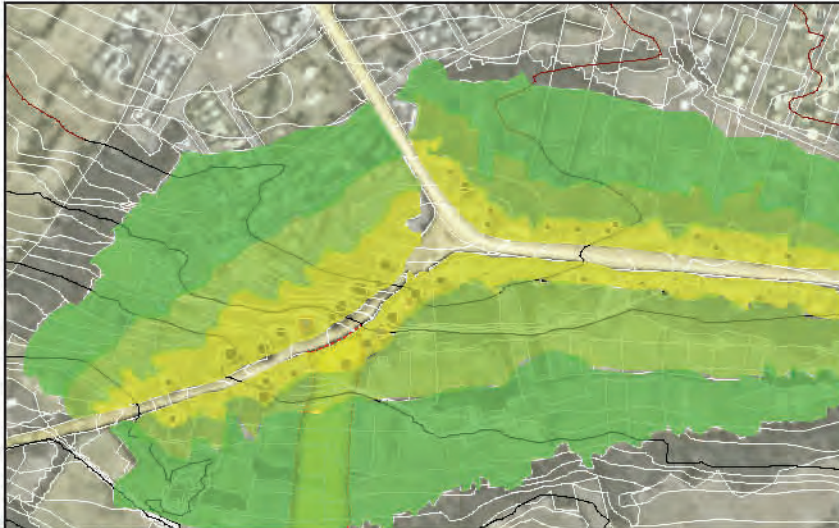
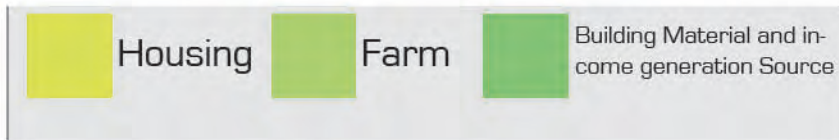


Figure 4.13.b. Land use map of settlement two (Google Earth + Overlays)



Figure 4.13.c. Topography of settlement two (Google Earth + Overlays)



Figure 4.13.d. Cross Section



Figure 4.13.e. Partial 3D of settlement two.

Case 2
Compound E
Owner Dejut Trarch

Number of houses 2
Front size of compound 65 m
Compound type 'private'



Compound: E

W/ro Dejut Trarch lives in a village called *Eguraguazervillage* settlement (See settlement II). She has five children of which three of them are female and two male. Two of her children live in Addis Ababa Working in small businesses. In her compound there are two house units the main house (*Goye*) which is circular in shape and covered with octagonal shaped roofing covered with corrugated iron sheet which was built 20 years ago. The other one is guest house (*herar*) it has circular shape and covered with thatch roof. This compound is well defined and fenced with split eucalyptus poles and planted pine woods and others. She has around $\frac{3}{4}$ *wedero* wide of front size land facing towards *jefwere*, which is around 54m, and it extends to the lowest ridge level to the backyard. The backyard of this compound is divided into many parts to accommodate various cultivations including *enset*. She has a ground water well for her domestic activities and she uses clean water from town. Since electricity is provided to the settlement she use it for lighting and wood as a source of fuel for heating and cooking. in her backyard she build shaded latrine pit for toilet use. She produces various farm products for food consumption, income generating, fuel consumption and construction materials for maintenance. She owns the compound alone and the land was transferred from her husband's parents several years ago.



Figure 4.15 Site Plan of Compound E
(Google Earth + Overlay)

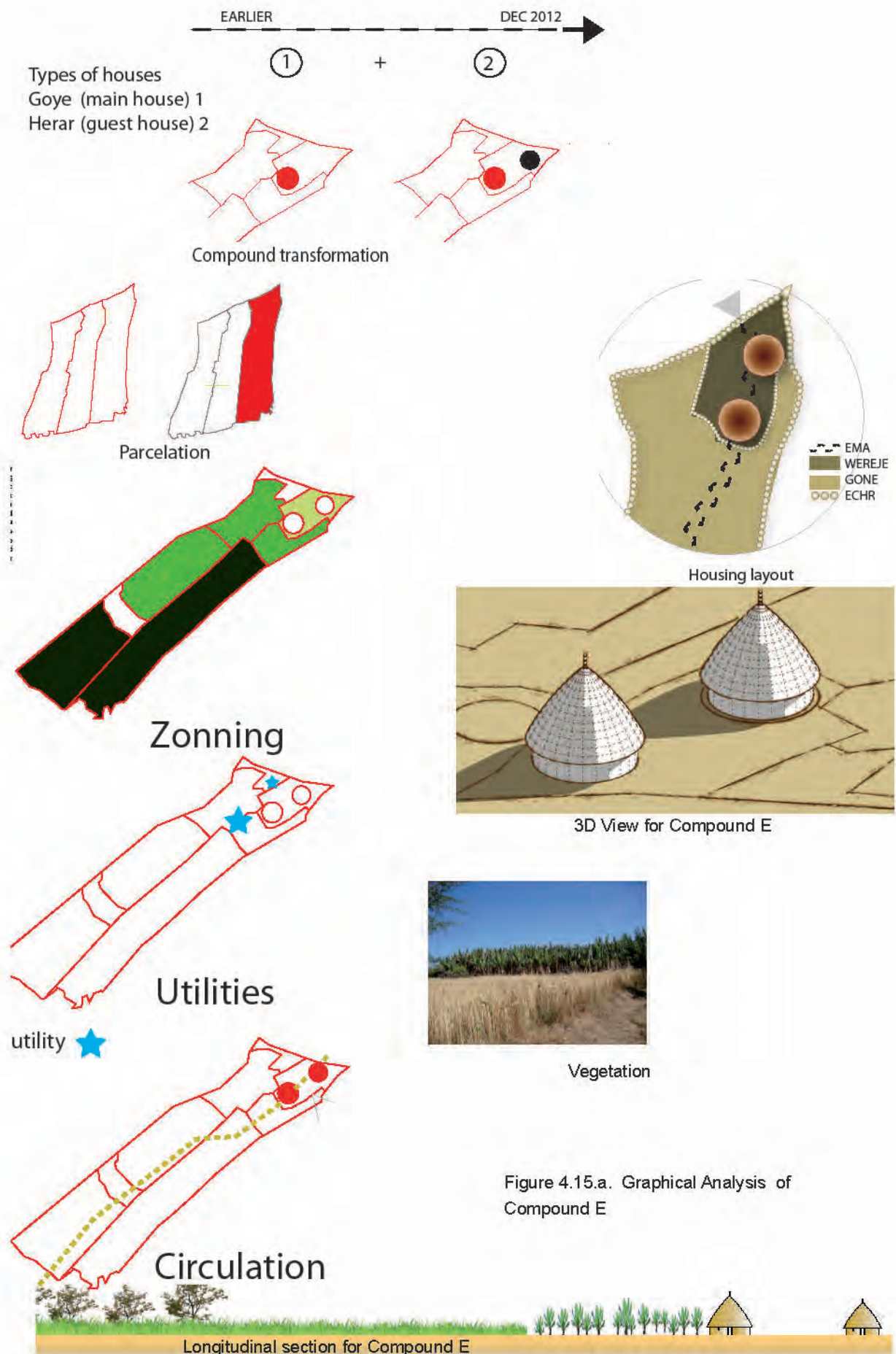


Figure 4.15.a. Graphical Analysis of Compound E



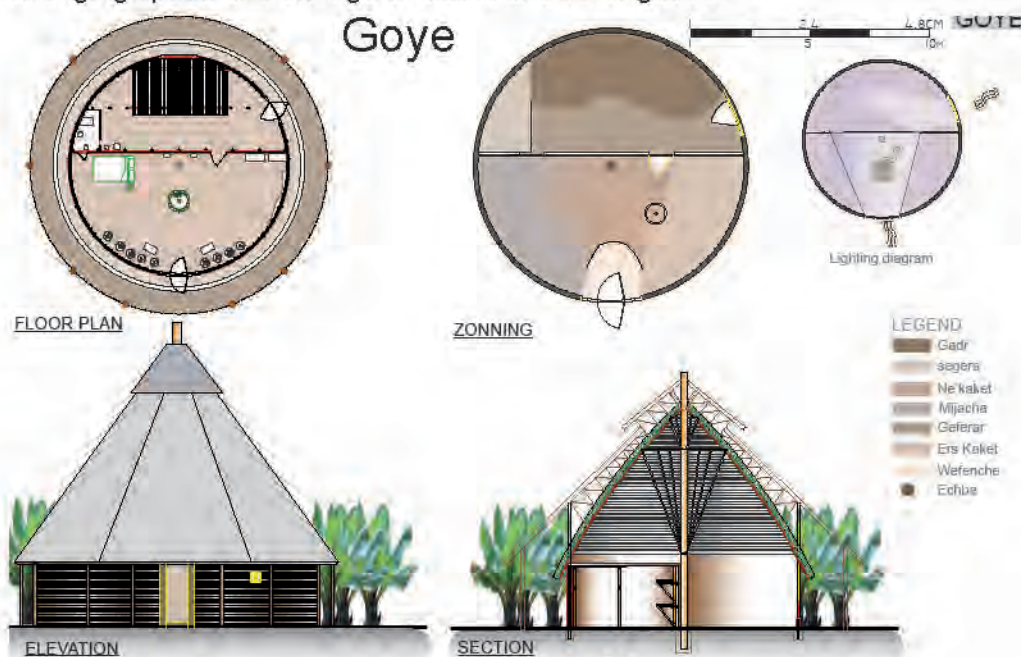
Figure 4.15.b. Pictorial Analysis of Compound E (Own pictures)

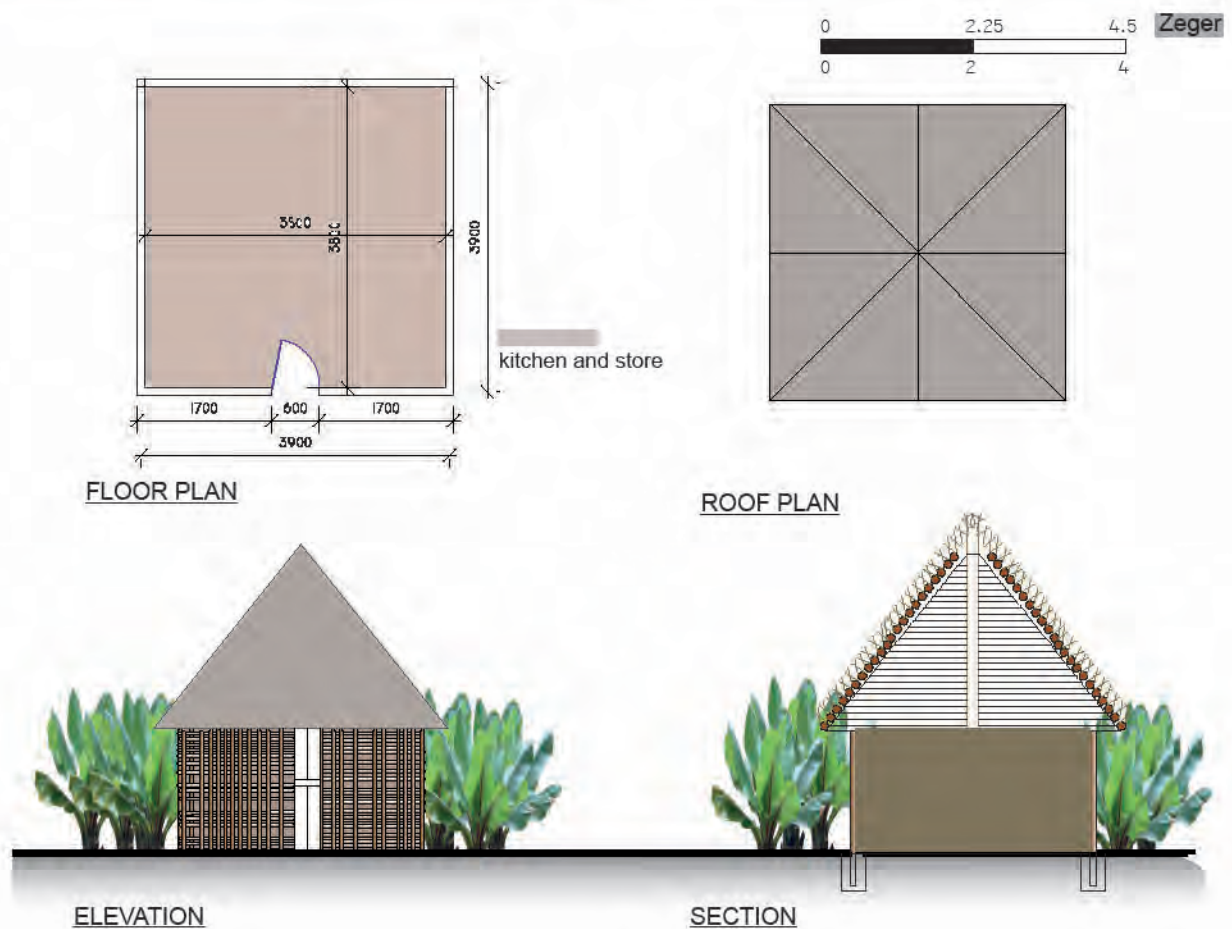
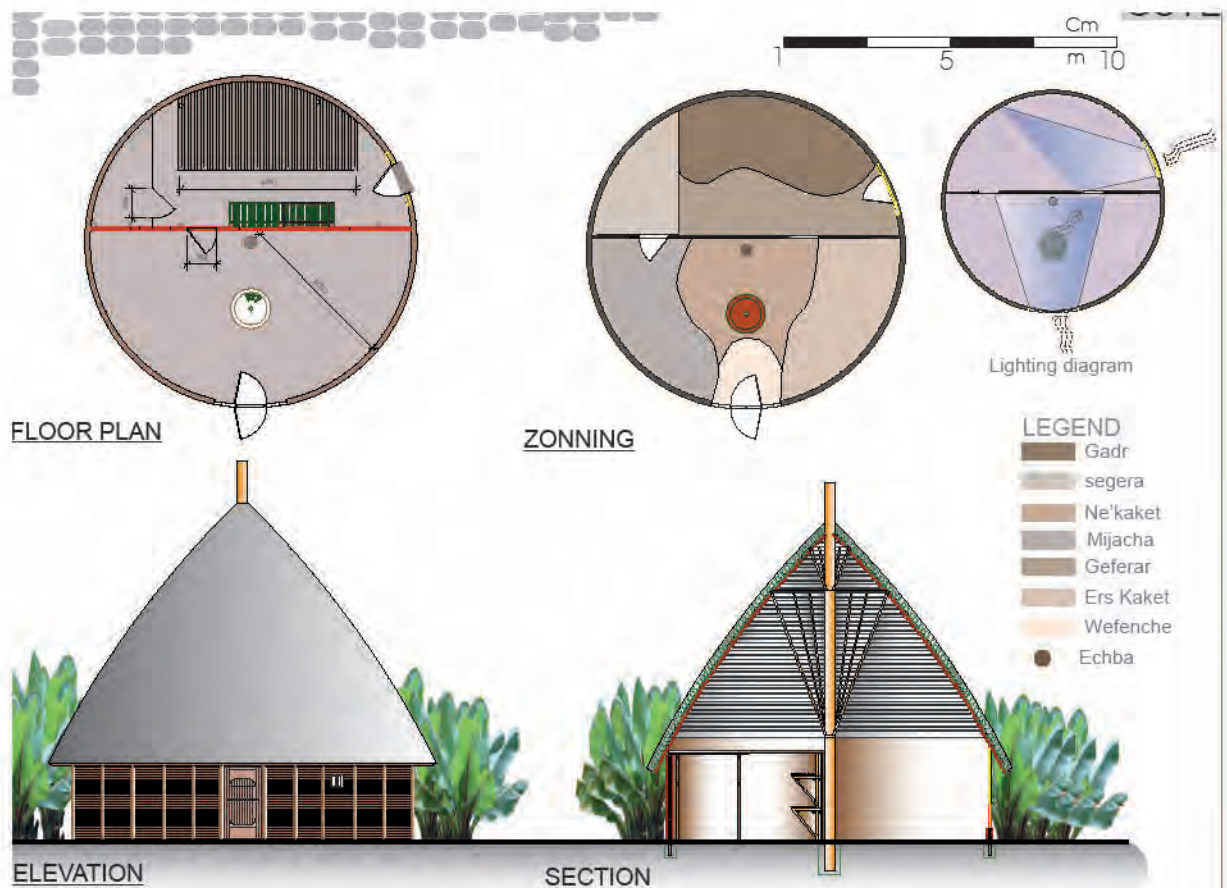
House Units: 4

House unit 4 belongs to W/ro Dejut Trarch who is described in compound E. She owns two house units. One is the main house which is described as follows; the extra roofing element they apply on top of the original (traditional) one creates a little distortion on the formal composition. This unit is covered with octagonal prismatic roofing by using corrugated Iron sheet having a ridge cup on top of every connection. They split the volume in to two so that it can allow roof ventilation. At the base of roof, there is extension from wall unit towards outside to create a verandah by supporting it with extra supporting posts around the perimeter. Externally height of the wall is increased till it touch the roof structure, even though from inside it keeps the original appearance since they did not demolish the traditionally built roof structure. They still use the central post and *wakas* or struts to support additional roofing elements.

Just as we enter to the house the first two elements we observe is the fire place and the post from which at the right and left there are the small and big *kaket* as they call it, which serves them as a living space, sleeping space, sometimes cooking, undertaking coffee ceremonies and socialization etc. Next to this space there is a wall element which used to be called *agdata*, but now it changes its height and appearance. This wall has a door which let access to inside space which is called *Derar* and it serves as kitchen, circulation for cattle to their *gadr*, which is located adjacent to it, and also used as storage. *Gadr* is defined with *nequoche* which is a vertical post used to tie cows and to support *kote'* (a storage and protection element and space). To the right side of both the *Derar* and *Gadr* there is a door to let access to the back yard.

The second house is used as a sleeping and reading space in ordinary days and as a guest house whenever there comes. This unit is composed of the a hyperbolic volume roof and cylindrical wall as it is seen externally. It has a wider *kaket* in proportion to its total area and a small *agdata* to segregate the *derar* space with the *kaket* one. *Derar* is used in this case as a changing space and storage of cloths and other goods.







Herar (Guest house)



Goye (Main house with CIS roofing)



Kaket (Multipurpose space)



Rarely used fireplace in main house



Working space in front of Cattle space

Figure 4.17.a. Graphical and pictorial Analysis of House unit 4

Analysis at Arekit

Settlement Egruaguazer

Availability of Infrastructure

Gravel Road	Electricity	telephone	Clean water	Health post	Religious center	school	cemetery	Mill house
√	√	x	x	x	x	x	x	x

Intervening elements

Gravel Road	Electric lines	Communal Water Sup.	School	Kebele Office	Town Expansion	Irrigation channel
√	√	x	√	x	√	x

Nature of topography

Plain	Partially folded	Fully Folded
-	-	√

Starting generation

Current (First)	Second	Third	Fourth	Fifth	Sixth	More
-	-	-	√	-	-	-

Distance from center of nearby town /km

0 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6
√					

No. of house units based on Google count (imagery date of Nov 6, 2006)

Thatch Circular	CIS Circular	CIS Square generated	Thatch Square generated
37	1	10	x

Table 4.02. Analysis of Settlement 2

Compound analysis in case two

Number of house units within a compound

Quantity	One	Two	Three	Four	Five
Percentage	-	80%	-	20%	-

Front size of a compound in *wedero*

Size	Two	One and half	One	Half	Less
Percentage	-	-	20%	80%	-

Owner Ship of a Compound

Owner ship	Private(single household)	Shared(multiple household)
Percentage	20%	80%

Fencing type

Type	None	Simple	strong
Percentage	-	-	100%

Number households within a compound

Quantity	One	Two
Percentage	80%	20%

Availability of latrine pit

Availability	Available	Not available
Percentage	100%	-

Usage of backyard

Usage	(A) food source	(B) income source	(C) material source	A & B	A & C	A,B & C
Percentage	-	-	-	-	40%	60%

Source of Energy

Sources	Wood and Kerosene	Electric and wood	Solar and wood
Percentage	17%	83%	-

Source of Water

Source	(A) Pumped water	(B) Ground water	(C) River	A and C	A,B & C
Percentage	-	-	-	-	100%

House unit Analysis of Case two

House unit types in a compound based on purpose

House types	Goye	Goye and Herar	Goye and Zeger	Goye, Herar and Zeger	Goye, Herar, Zeger and Extra units
percentage	-	80%	-	-	20%

Shape and Roofing types

	Circular and thatch	Circular and CIS	Rectangular and thatch	Rectangular and CIS
Goye	80%	20%	-	-
Herar	80%	-	-	20%
Zeger	20%	-	80%	-
Extra Unit	-	-	-	100%

Wall Connecting Material

	(A) Nail	(B) Rubber	(C) Wedere	A&B	A&C	B&C	A,B&C
Goye	20%	-	70%	10%	-	-	-
Herar	40%	-	-	-	60%	-	-
Zeger	20%	-	-	-	80%	-	-
Extraunit	-	-	-	-	-	-	100%

Structural connection method

	Only nailing	Rope, groove and socket	Others with nailing
Goye	-	80%	20%
Herar	40%	60%	-
Zeger	-	20%	80%
Extra unit	-	-	100%

Income Source of a household

sources	(A) Children support	(B) farm	(C) Farm & business	A&B	A&C
percentage	20%	40%	20%	20%	-

Usage of front fire place in goye

Frequency	Intensive	Occasional	Seldom	Never
Percentage	80%	20%	-	-

Resource Accessibility

	Easy	Medium	Difficult	None
Thatch	20%	20%	60%	-
Local builder	20%	80%	-	-

Number of doors

	One	Two	Three	More
Goye	-	60%	40%	-
Herar	-	60%	-	40%
Zeger	100%	-	-	-
Extra unit	-	-	-	100%

Number of Window

	One	Two	Three	None
Goye	20%	20%	60%	-
Herar	20%	40%	40%	-
Zeger	20%	-	-	80%
Extra unit	-	20%	80%	-

Floor Finish material

	Traditional matt	PVC matt	Cow dung screed	Cement screed	None
Goye	100%	-	-	-	-
Herar	60%	-	-	40%	-
Zeger	-	-	20%	-	80%
Extra units	-	-	-	100%	-

Internal wall finish

	Mud plastering	Painted	Cow dung plastered	None
Goye	40%	-	60%	-
Herar	40%	-	60%	-
Zeger	-	-	20%	80%
Extra unit	-	100%	-	

External wall finish

	Wooden	Bamboo	Mud plastered	painting
Goye	-	100%	-	-
Herar	60%	40%	-	-
Zeger	-	-	100%	
Extra unit	-	-	-	100%

Window types

	Wooden	Wooden frame with glass	Metal frame with glass	Bamboo	None
Goye	40%	-	-	60%	-
Herar	40%	-	-	60%	-
Zeger	-	-	-	20%	80%
Extra unit	-	100%	-	-	-

Door type

	Wooden	Wooden frame with glass	Metal frame with glass	Bamboo
Goye	100%	-	-	-
Herar	80%	20%	-	-
Zeger	80%	-	-	20%
Extra unit	100%	-	-	-

House unit size in diameter or equivalent

	10 to12m	8to10m	6to8m	4to6m	Less than 4m
Goye	40%	40%	20%	-	-
Herar	-	40%	40%	20%	-
Zeger	-	-	-	20%	80%
Extra unit	-	80%	20%	-	-

Conditions of Partitions

	Fully	Partially	Fractionally	none
Goye	-	40%	40%	20%
Herar	40%	20%	20%	-
Zeger	-	-	-	100%
Extra unit	100%	-	-	-

4.2.3. Case Three: Geta Wereda (Close to Quante town)

Quante is the capital town of *Geta wereda* which is located at a distance of 97km from *welkite* and 248km from Addis Ababa. The *Wereda* covers 13,800 hectare area of land and composed of 16 *kebeles*. It has around 120,000 population of which 59,520 is male and 60,480 is female. The climate condition classified in to two categories which are 13% is *weynadega* and 87% *dega*. It has a topographical feature of 25% plain, 60% unevenly folded and 15% mountainous. The altitude ranges from 2300m to 3000 above sea level.



Guraghe zone wereda map

Figure 4.20. Location map of Case Three: Gumer Wereda (EMA + Overlays)

Settlement III: Gameso Village Settlement

It is located in *Geta Wereda*, *Senen kebele* at a distance of 5.5 km from the capital town *Quante*. Of the long and continuous *jefwere* of *Senen* the study focuses only on, a segment, the *Gameso got'* which contain 34 households. The settlement is organized by having the *jefwere* at the top center of the ridge of the topography and aligning compounds and clustered houses to the right and left. Almost all households base their life on agriculture base on Ato Kedir Mohammed's explanation. They grew *Enset*, Sorghum, wheat, bean, and various fruits and vegetables including potato etc. There is no infrastructure provision in this settlement as explained by Ato Kedir and own observation.

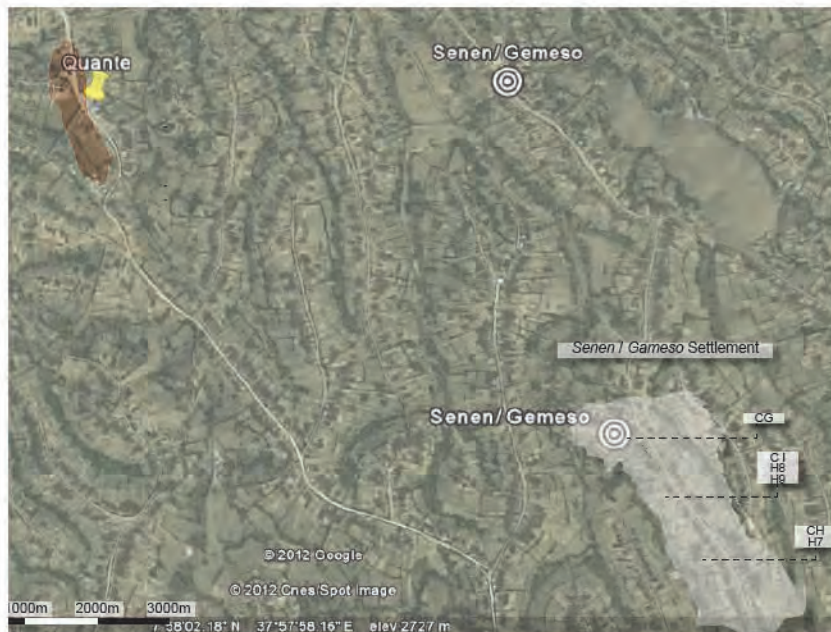


Figure 4.21. Location map of Settlement Three (Google Earth + Overlays)

Legend: CG- Compound G H7 - House unit Seven



Figure 4.22 Layout of Settlement three (Google Earth + Overlays)

Legend: ■ - Rectangular house units ● - Traditional house units ■ - Single Compound

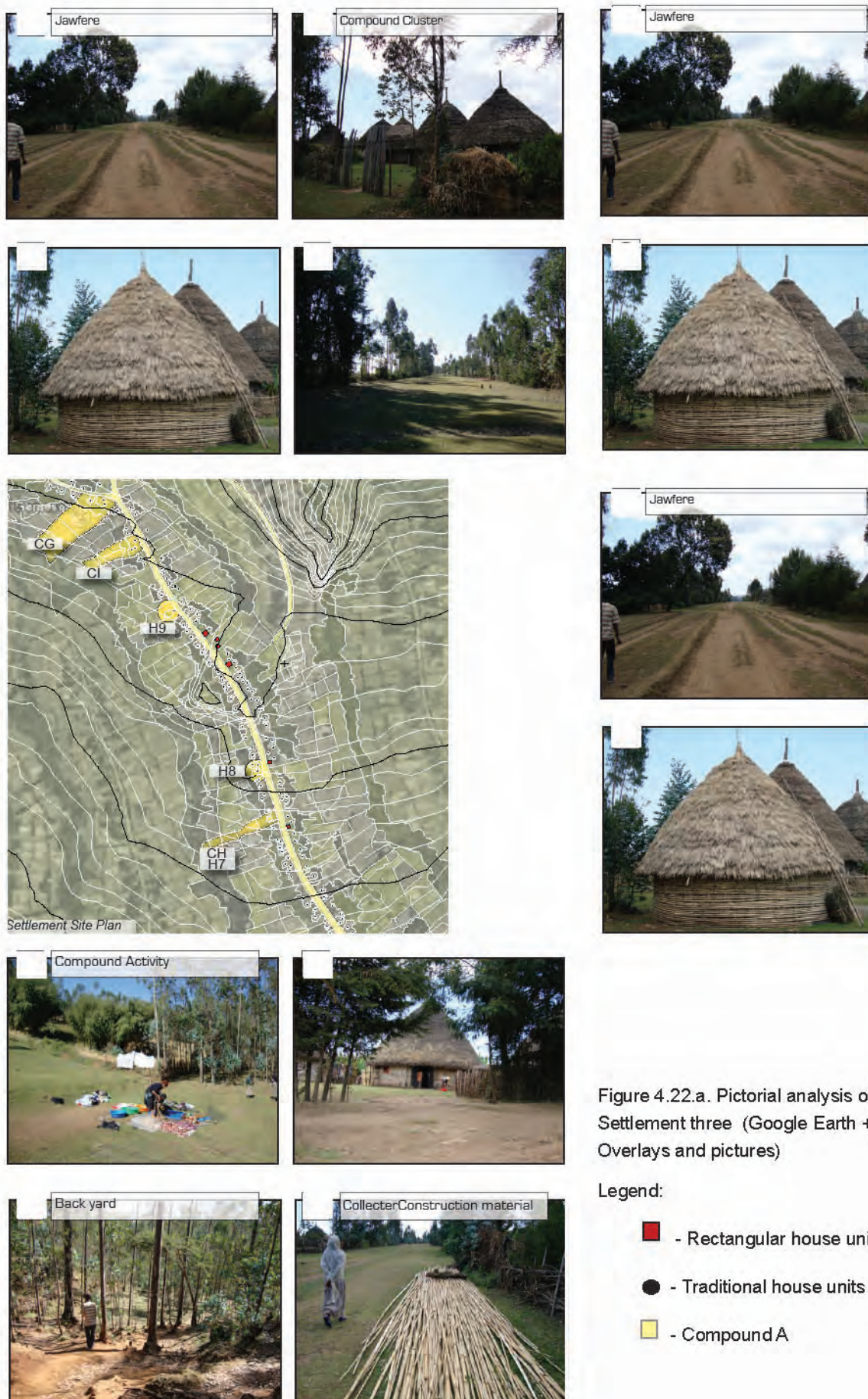


Figure 4.22.a. Pictorial analysis of Settlement three (Google Earth + Overlays and pictures)

Legend:

- - Rectangular house units
- - Traditional house units
- - Compound A

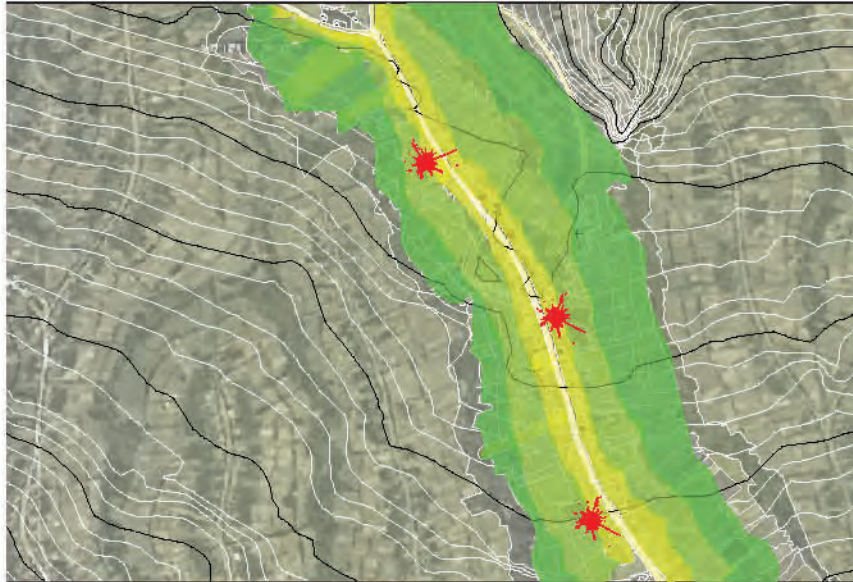
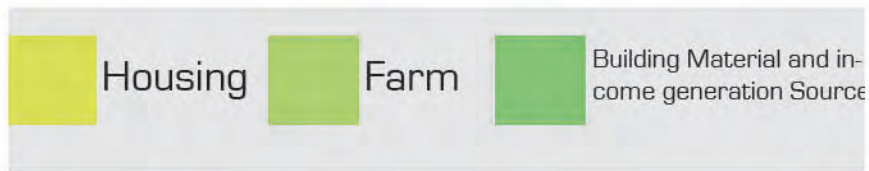


Figure 4.22.b. Land use map of settlement three (Google Earth + Overlays)



Figure 4.22.c. Topography of settlement three (Google Earth + Overlays)

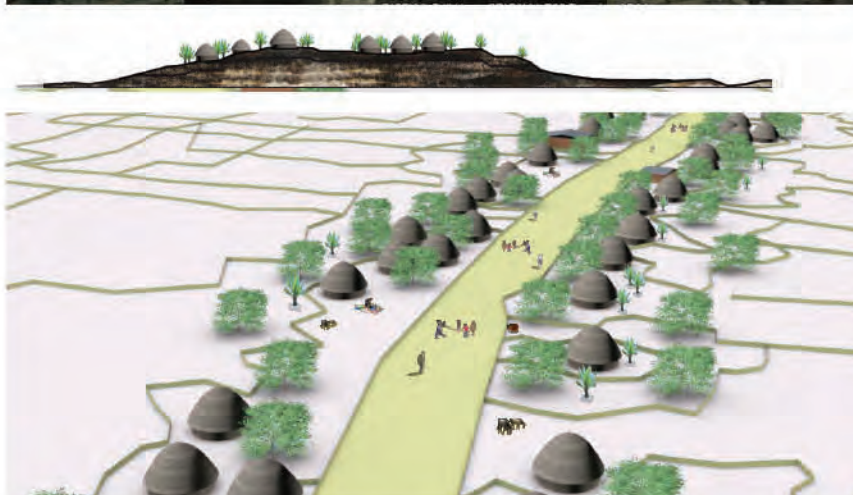


Figure 4.22.d. Cross Section



Figure 4.22.e. Partial 3D of settlement three.

Case 3
Compound G
Owner Dejut Tarch

Number of houses 5
Front size of compound 133 m
Compound type 'shared'



Ato Kedir Mohammed is 55 years old he has four children living with him, he lead his life based on agriculture. In his compound he has three house units of which one is to be demolished and the other one is under construction, which is on the stage of completion of wall construction; the third one is where the family living and used as main house unit. He has 1½ *wedero* wide, around 108m, of land at the front width, which, his father transferred for him and his brother next to his compound. The compound is defined with external fence, internal fence, *enset* plants and the three house units which determine the limit of back yard and front yard as a boundary. This compound is located at the corner, where three *jefweres* connected and where there is a horse tying buried basaltic stone which is called *Maguene*. Ato Kedir produces *enset*, vegetables, wheat, sorghum, and also he planted bamboo and pine tree at the back end of his compound which are used as a backup for construction and maintenance of his house. He uses kerosene as a source of energy for lighting purpose and wood for cooking and generating heat for the house. A shaded latrine pit is available in the backyard serving as toilet.



Figure 4.23 Site Plan of Compound G
(Google Earth + Overlay)

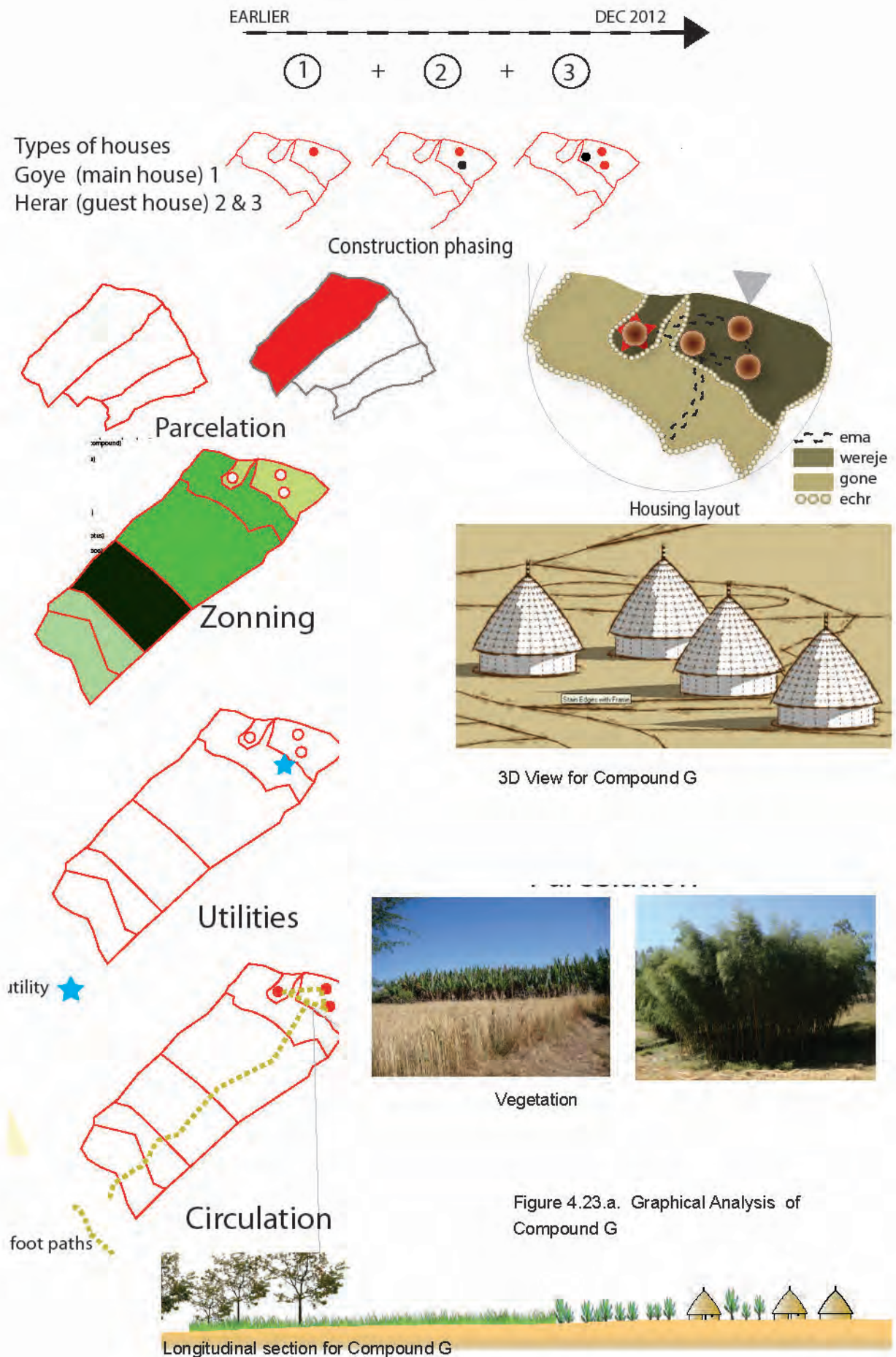




Figure 4.23.b. Pictorial Analysis of Compound G

Summary of interview with a traditional builder in Gameso

Ato Kuere Bereka was working on the new house unit of Ato Kedir Mohammed, as he explained the process, the first step for the construction of a *Gurage* traditional house unit is selecting where it is going to be built, so that the leveling work can begin. And then the size of the house will be decided by the client based on his capability in terms of material provision. After which, selection of the central post will be done, which is a local pine wood in this case, to be cut after some time around a year or more in the mean while the client will prepare other materials for the construction of wall. In this case the wall construction is being finalized and it was about to cut the chosen central post from other village; which is because Ato kedir does not have a local pine tree ready to be used as a central post (*echba*).

Then, as he continues to explain, since the construction of a *Gurage* traditional house can be done phase by phase, it can be started as soon as wall materials are ready, as it is done for Ato kedir, or it can also be done at once after the completion of collecting all necessary materials. To construct the wall the first step is marking the required diameter of the circle in such a way that a small wooden peg will be immersed to the ground at the center of the prepared site and rope will be tied on it and stretched to the periphery to guide the builder measure the radius using his foot, then the number of foot count will be the radius as decided by the client. And at the end of the foot count they will tie the other end of the rope on handle of their knife like tool, which is big and strong enough for marking the circumference. After marking they will start to dig out the outer side of the marking in a depth of one stretched forearm length after which they will start putting the split pine wood which was prepared in a length of seven stretched forearm length of which one is to be buried in the ground as it is done for Ato Kedir. After the vertical wall post members are buried a guiding circular members will be tied on the top end, middle and bottom of the vertical members where the builder check and correct its precision by relating it with the ground. During the wall construction phase there should be a lot of workers to do the labor work while the builder is guiding, in this case Ato Kedir assigned young men in the community before two weeks of the wall construction so that they will adjust their program accordingly. That was how he got help during the wall construction. After the guiding circular members are tied they put inclined bracing member from the midpoint of the wall to the ground so that it will keep it precision all the time. And then they will start to tie up the circular members both in the internal and external in Ato Kedirs' case they use split bamboo for the external and pine tree branches and thin bamboos in the internal member and they use *wedere* (rope from *enset* plant usually dried steam) as a connecting material. He also explained that before beginning the wall construction we decided location of the doors and buried the four basic vertical supporting members of the door a bit deeper than the wall and connects them at the top respecting the door size. In this case where there are two doors one at the front and the other to the right side behind the midpoint where he planned to make a partition wall. The next step is to cut the proposed pine tree from its place, in this case it is already cut and made ready to be transported to Ato Kedirs' compound which needs a group of men and he already announced to them the date when they will bring the post. After which it will be erected at the center of the circle where the borehole is ready in a depth of two

stretched forearm length. Before erection the builder will mark important measurements on the post where the eye of the roof will be placed, where the big and small struts radiate to support the roof structure starting from the level to be, after it is buried in the ground. The rest of the length will be left on the top which is a minimum of immersed length in the ground. Which is not done yet on Ato Kedirs' site, he continued his explanation to the next stages in similar way that Ato Amsr Ekuses' builder explained which is continued in Compound 'J'.

House Units: 9



W/ro Nejibat Seid is 45, married and has five children of which two lives in Addis. She has three house units. One is the main house, as it is entered to this unit there are two spaces which are used as multipurpose. To the right side of the entrance there is a sleeping space with furnished bed covered with curtain, near to it there is a mat which is used as a prayer and dining space. To the left side of the entrance there are sitting stools as they call them *berchuma* where guests and neighbor sit for coffee and socialization. At the center of the house there are the fire place and central post. Behind the central post there is a wooden partition wall which divides the social space and the space behind. Behind the wall there are two spaces the *derar* which is being used as a cooking and storage space and the *gadr* for the cattle defined with *nequoche* and *kote* and between them there is an enclose small space which is used only for storage of important goods. The second one is the guest unit tukul which is currently used by children as a study and sleeping room till there comes a guest to their house. It has also a storage and changing space behind the short *agdata* partition wall. The third unit is under construction to be used as a kitchen and storage space as they call it *Zeger*. On the roof top of the main house (Goye) there is a solar panel to collect energy from the sun throughout the year. They use this energy for lighting and for their recorders and radio. Wood is utilized for fuel consumption of cooking, generating heat and others. They use latrine pit in the back yard as a toilet. They use water from river, spring and ground water from well.

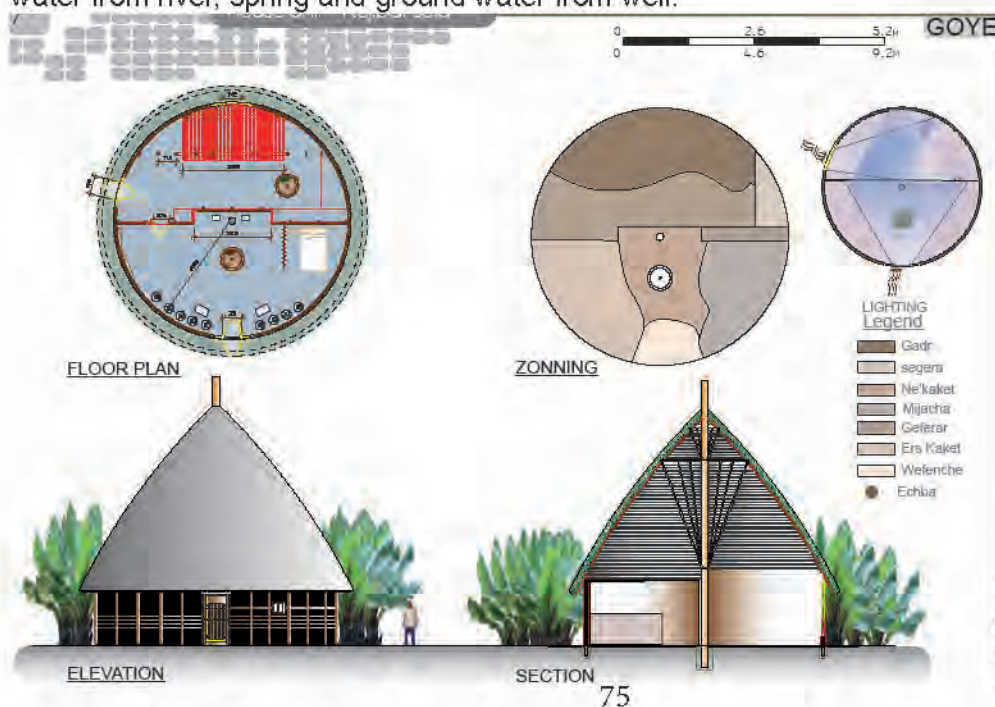


Figure 4.28
Graphical Analysis
of House unit 9

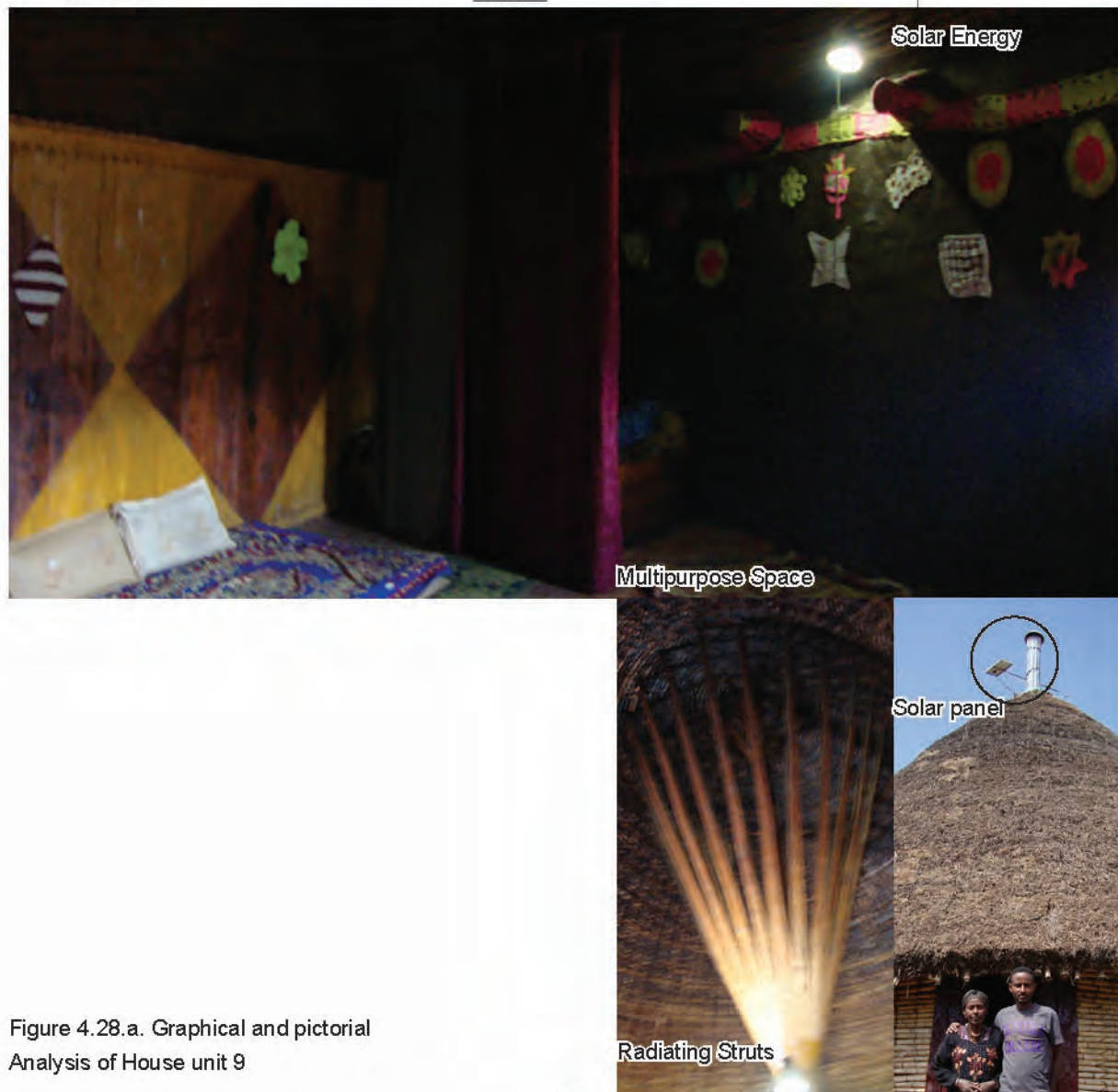
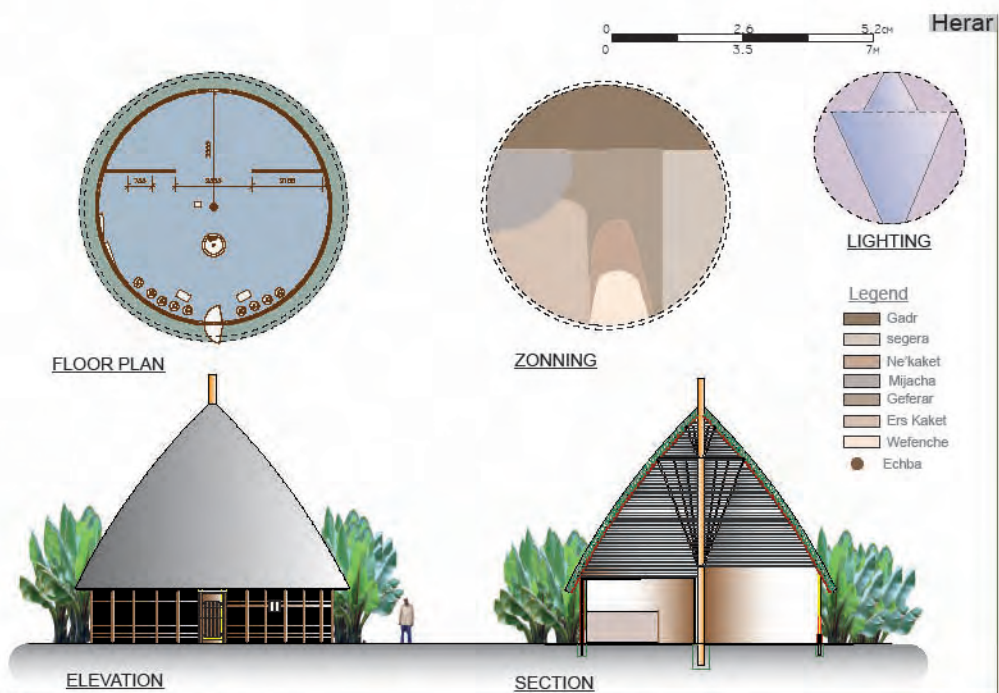


Figure 4.28.a. Graphical and pictorial Analysis of House unit 9

Analysis at Quante

Settlement Gameso

Availability of Infrastructure

Gravel Road	Electricity	telephone	Clean water	Health post	Religious center	school	cemetery	Mill house
x	x	x	x	x	√	x	√	x

Intervening elements

Gravel Road	Electric lines	Communal Water Sup.	School	Kebele Office	Town Expansion	Irrigation channel
x	x	x	x	√	x	x

Nature of topography

Plain	Partially folded	Fully Folded
-	-	√

Starting generation

Current (First)	Second	Third	Fourth	Fifth	Sixth	More
-	-	-	-	-	-	√

Distance from center of nearby town

0 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6
					√

No. of house units based on Google count (imagery date of Nov 6, 2006)

Thatch Circular	CIS Circular	CIS Square generated	Thatch Square generated
120	x	10	0

Table 4.03. Analysis of Settlement 3

Compound analysis in case three

Number of house units within a compound

Quantity	One	Two	Three	Four	Five
Percentage	-	60%	40%	-	-

Front size of a compound in *wedero*

Size	Three fourth	One and half	One	Half	Less
Percentage	20%	-	60%	20%	-

Owner Ship of a Compound

Owner ship	Private(single household)	Shared(multiple household)
Percentage	80%	20%

Fencing type

Type	None	Simple	strong
Percentage	20%	60%	20%

Number households within a compound

Quantity	One	Two
Percentage	80%	20%

Availability of latrine pit

Availability	Available	Not available
Percentage	100%	-

Usage of backyard

Usage	(A) food source	(B) income source	(C) material source	A & B	A & C	A,B & C
Percentage	-	-	-	-	40%	60%

Source of Energy

Sources	Wood and Kerosene	Electric and wood	Solar and wood
Percentage	80%	-	20%

Source of Water

Source	(A) Pumped water	(B) Ground water	(C) River	A and C	A,B & C
Percentage	-	-	-	-	100%

House unit Analysis of Case three

House unit types in a compound based on purpose

House types	Goye	Goye and Herar	Goye and Zeger	Goye, Herar and Zeger	Goye, Herar, Zeger and Extra units
percentage	20%	40%	0%	40%	-

Shape and Roofing types

	Circular and thatch	Circular and CIS	Rectangular and thatch	Rectangular and CIS
Goye	80%	-	-	20%
Herar	60%	40%	-	-
Zeger	60%	40%	-	-
Extra Unit	-	-	-	-

Wall Connecting Material

	(A) Nail	(B) Rubber	(C) Wedere	A&B	A&C	B&C
Goye	20%	-	80%	-	-	-
Herar	-	-	60%	-	-	40%
Zeger	-	40%	-	-	-	60%
Extraunit	-	-	-	-	-	-

Structural connection method

	Only nailing	Rope, groove and socket	Others with nailing
Goye	20%	80%	-
Herar	-	60%	40%
Zeger	-	40%	60%
Extra unit	-	-	-

Income Source of a household

sources	(A) Children support	(B) farm	(C) Farm & business	A&B	A&C
percentage	-	60%	20%	20%	-

Usage of front fire place in goye

Frequency	Intensive	Occasional	Seldom	Never
Percentage	80%	-	20%	-

Resource Accessibility

	Easy	Medium	Difficult	No
Thatch	20%	60%	20%	-
Local builder	-	80%	20%	-

Number of doors

	One	Two	Three	More
Goye	20%	-	60%	20%
Herar	20%	60%	-	20%
Zeger	20%	-	-	80%
Extra unit	-	-	-	-

Number of Window

	One	Two	Three	More
Goye	20%	-	20%	60%
Herar	-	-	60%	40%
Zeger	-	-	20%	80%
Extra unit	-	-	-	-

Floor Finish material

	Traditional matt	PVC matt	Cow dung screed	Cement screed
Goye	100%	-	-	-
Herar	60%	-	-	40%
Zeger	-	-	40%	60%
Extra units	-	-	-	-

Internal wall finish

	Mud plastering	Painted	Cow dung plastered	None
Goye	20%	60%	20%	-
Herar	-	20%	40%	40%
Zeger	-	-	20%	80%
Extra unit	-	-	-	-

External wall finish

	Wooden	Bamboo	Mud plastered	painting
Goye	-	80%	-	20%
Herar	60%	-	-	40%
Zeger	80%	-	-	20%
Extra unit	-	-	-	-

Window types

	Wooden	Wooden frame with glass	Metal frame with glass	Bamboo	None
Goye	40%	-	-	60%	-
Herar	20%	-	40%	40%	-
Zeger	-	-	-	40%	60%
Extra unit	-	-	-	-	-

Door type

	Wooden	Wooden frame with glass	Metal frame with glass	Bamboo	Not available
Goye	100%	-	-	-	-
Herar	60%	-	-	40%	-
Zeger	80%	-	-	20%	-
Extra unit	-	-	-	-	-

House unit size in diameter or equivalent

	10 to12m	8to10m	6to8m	4to6m	Less than 4m
Goye	40%	-	60%	-	-
Herar	40%	-	20%	40%	-
Zeger	80%	-	-	20%	-
Extra unit	-	-	-	-	-

Conditions of Partitions

	Fully	Partially	Fractionally	none
Goye	20%	60%	20%	-
Herar	20%	40%	40%	-
Zeger	-	-	-	100%
Extra unit	-	-	-	-

4.2.4. Case Four: Enemor and Ener Wereda (Close to Gunchre town)

It is composed of 64 rural kebeles and two town administrations, and it covers larger area than others which is 107, 574 hectare of land. Its capital town *Gunchre* is located at a distance of 42km from *Welkite* and 197km from Addis. The land feature is a combination of 40% plain, 30% unevenly folded, 25% plateau and 5% mountainous. Total population of 182, 765 of which 47.24% are male and 52.76% are female. The percentage of rural to town population is 96.1% to 3.9%. the average population density is estimated to be 170 people per square kilometer. The climatic condition ranges in to three categories which are locally known as, *kola* 26.25%, *Dega* 16.22% and the rest is *Weynadega* which is 57.53%.



Guraghe zone wereda map

Figure 4.29. Location map of Case Four: Enemor and Ener Wereda (EMA + Overlays)

Settlement IV: Weredped Village Settlement

It was established by four friends and the grandfather of Amsr Ekuse Gemye who is now 75 years old. The settlement is located 2km towards North East of the capital town *Gunchre* whose name derived from a *zigba* tree called *Gunchr*. In this settlement there are about 29 households. The main income generating mechanism, in this settlement, are the production and selling of *Chat* and Coffee plantations. Some of them, like *Ato Wendimu Melis*, are suppliers for merchants from Addis and *Welkite*. They also produce *enset* and others for domestic use. One elementary school is placed at the junction of three *jefweres* in the settlement. One ground water pumper (locally called *bono*) is provided by NGO for the supply of drinkable water for the community. The topography has a folded nature having a top ridge and bottom valley and a portion of it also branch out with the same nature allowing the extension of additional *jefwere*.

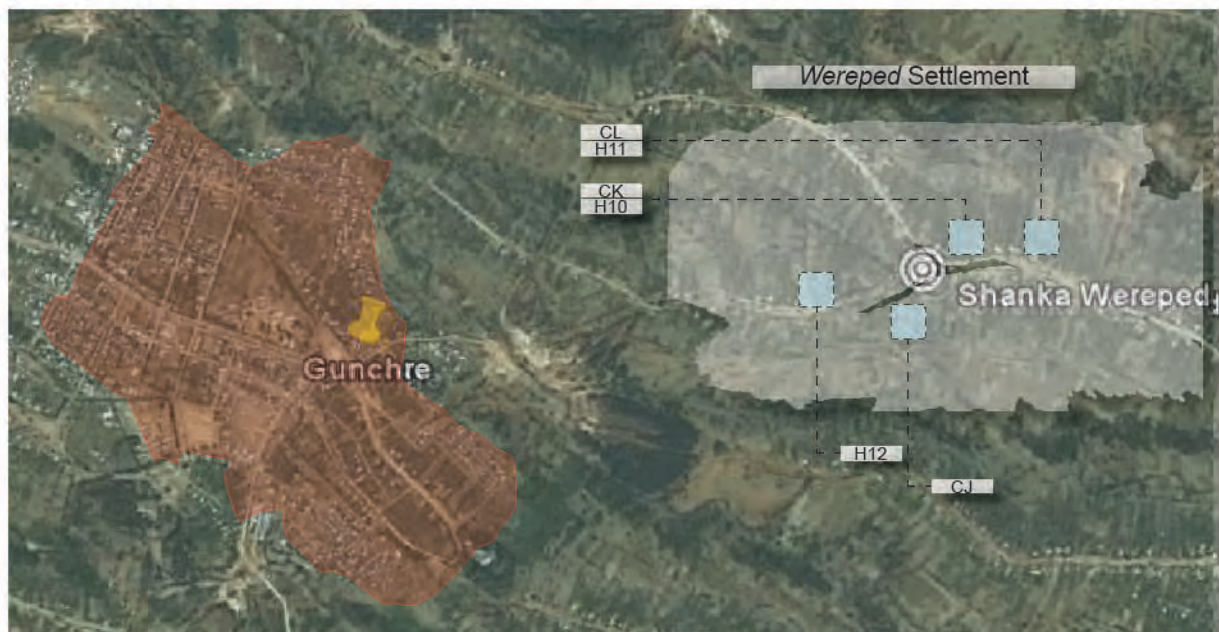


Figure 4.30. Location map of Settlement four (Google Earth + Overlays)

Legend: CL- Compound L H11 - House unit eleven



Figure 4.31. Layout of Settlement four (Google Earth + Overlays)

Legend: ■ - Rectangular house units ● - Traditional house units - Single Compound

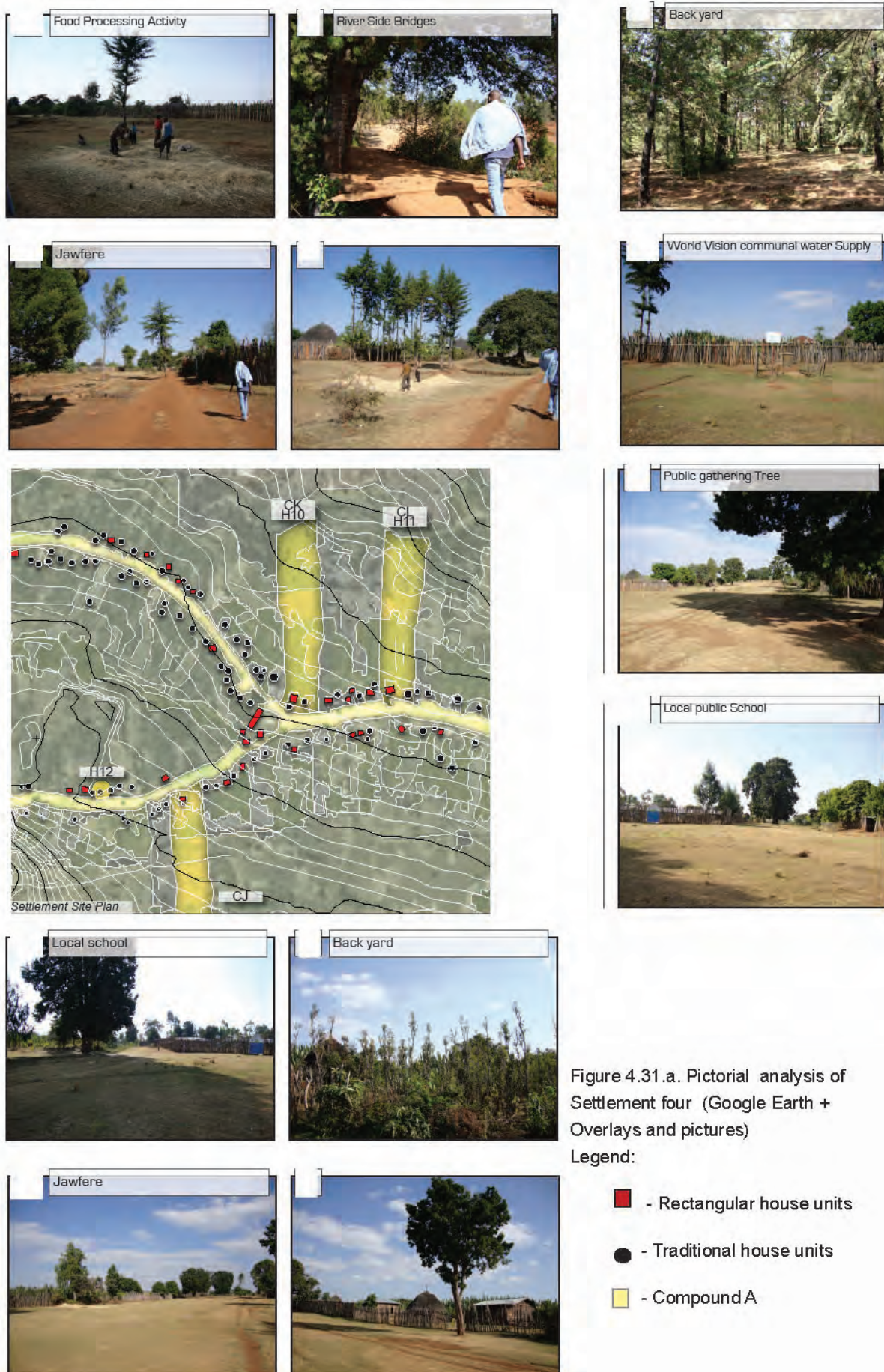


Figure 4.31.a. Pictorial analysis of Settlement four (Google Earth + Overlays and pictures)

Legend:

- Rectangular house units
- Traditional house units
- Compound A

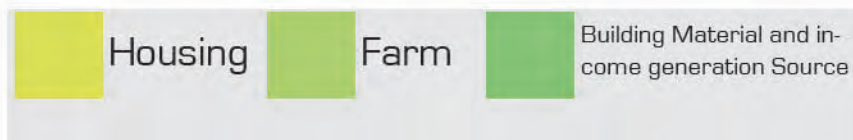


Figure 4.31.b. Land use map of settlement Four (Google Earth + Overlays)



Figure 4.31.c. Topography of settlement four (Google Earth + Overlays)



Figure 4.31.d. Cross Section



Figure 4.31.e. Partial 3D of settlement four.

Case 4
Compound J
Owner Amsr Ekuse

Number of houses 3
Front size of compound 80 m
Compound type 'private'



Compound: J

Ato Amsr Ekuse is now 75 years old has seven children three of them are living in Addis Ababa. He used to work for government during the *Derg* regime and now he is a farmer in *wereped* village. He owned his land through transfer from his father which measure around one *wedero* which is around 84ms in this area. In his compound he has one corrugated Iron sheet roof covered unit as a main unit and one tukul which is under construction at the stage of beginning of roofing. He want to build the tukul because this days it is getting very hot specially from November to May and it is creating discomfort not only on people also for cattle. He said that I used to spend some times in the neighbors tukul during sunny and hot days. So my children support the idea of building a tukul unit. His compound is defined with the old *korkoro-bet*, which was built in 1983, external and internal fences, and the newly built tukul unit in addition to the *enset* defining character. He produces *enset*, coffee, chat, vegetables, wheat, sorghum and *teff*. He also uses his plot to reserve hay for cattle, thatch for roofing, pine wood and eucalyptus for construction. He uses river water for domestic use and communal pump water provided by NGO for drinking. Wood is a major energy source for cooking and he also uses kerosene for light provision during night time. He build a small shade on top of the latrine pit in his backyard to use it as a toilet.

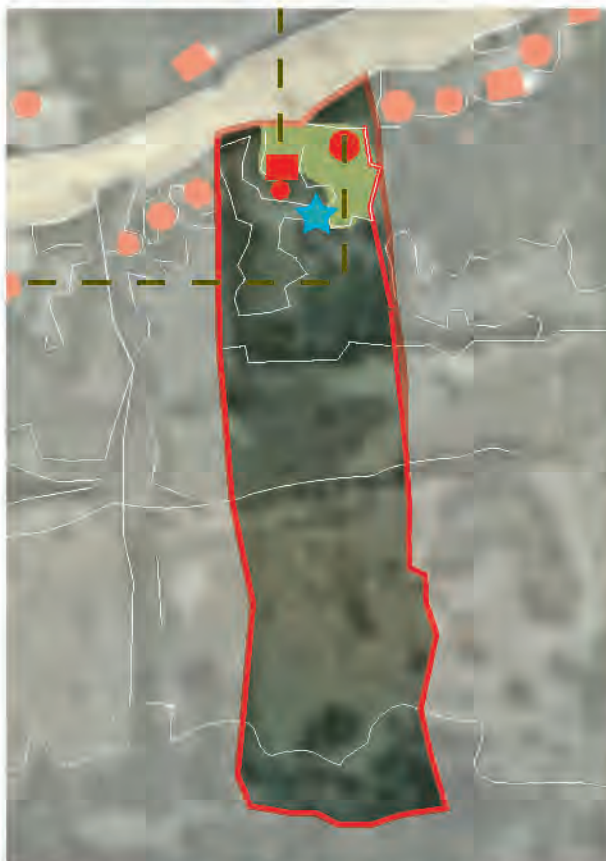


Figure 4.32 Site Plan of Compound J
(Google Earth + Overlay)

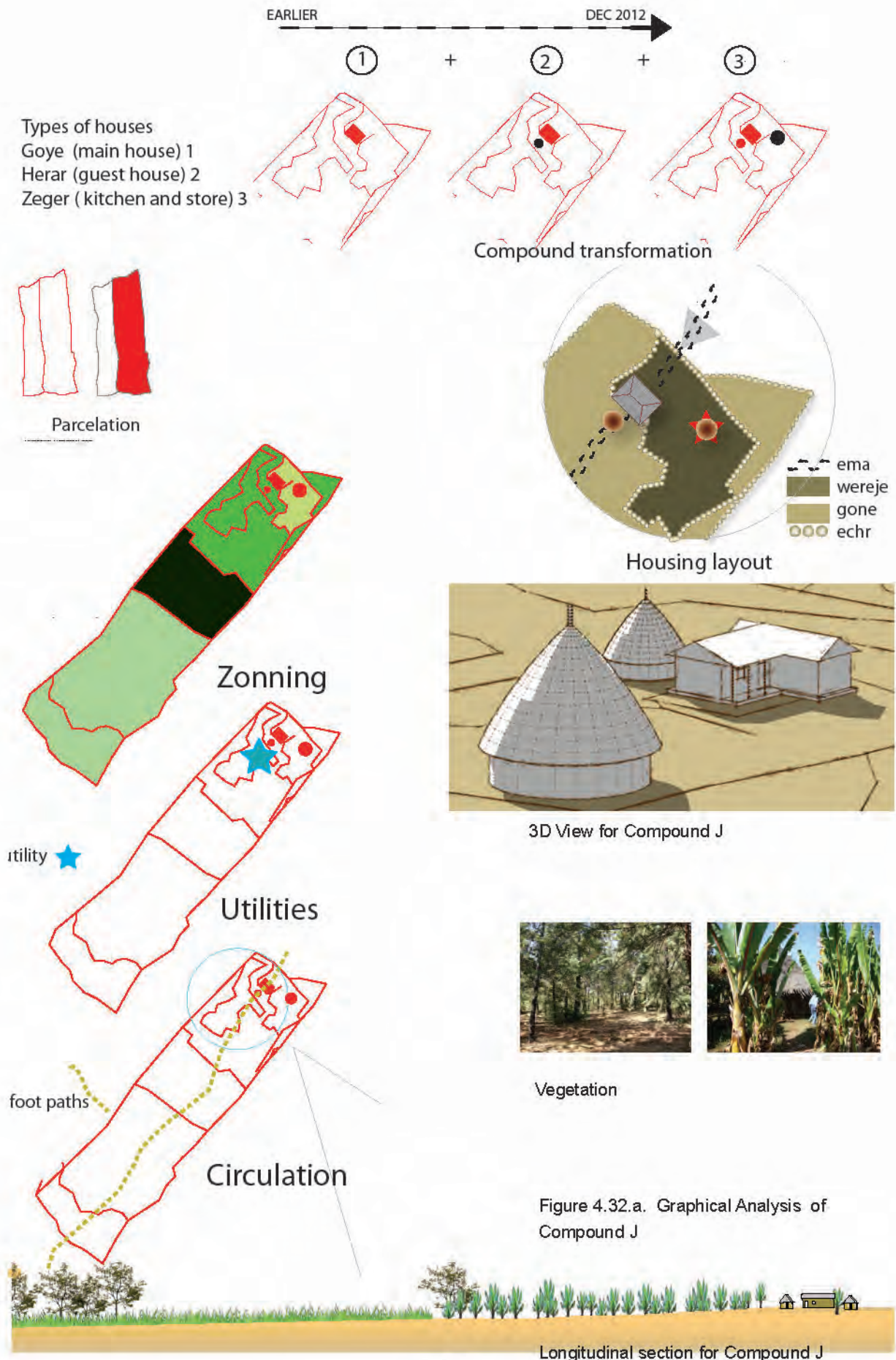


Figure 4.32.a. Graphical Analysis of Compound J



Figure 4.32.b. Pictorial Analysis of Compound J

Summary of interview with traditional builder of Ato Amsr Ekuses' new house unit

Ato Amsr Ekuses' new traditional house unit is on the stage of the beginning of roofing work and I manage to meet the traditional builder whose name is *Ato Moshe Mare* though he explained from the beginning to the end in detail I will present only from the stage where I paused in Ato Kedirs' case which is next to erection of the central post. After erection of the central post they will make scaffolding which can let them work on the roofing stage. This scaffolding has four vertical posts near to the central post and diagonal members coming from the internal top level of the cylindrical wall which will be supported by the four posts at the other end and on top of this members horizontal members will be added to serve as a ladder and standing positions which will allow the workers do the roofing job. That is where the stage of this case for the moment but according to this traditional builders' explanation the next stage is the roofing where many labor work is required and more time is given. To start the roofing he will make a groove on the post at exactly same dimension with the diameter of the tukul as it is true for this case, but he also mentioned in some cases this measurement might be less or more based on the clients requirement but I do not suggest such variations as he said. After making a groove the first 16 members radiate from the groove of the post after which as he explained since the post has limited circumference for all radiating members it is a must that '*chefat*' should be done as they call it. '*Chefat*' is made by using rope starting from the post itself, first it will be tied on the groove where the 16 members started and then it will be wrapped on each member spirally outwards from the post till it reaches a minimum of one *sinzir* so that it will create a surface to add more radiating members for the roof structure while doing so each radiating members should be tied in highly tensed manner against the wall at their end so that it will create a curve throughout its section or length. After connecting the basic radiating members the spiral roof members will be started from the '*chefat*' which are tied with the radiating members till the top level of the wall having a maximum spacing of four fingers. After which the smaller strut at the top will be made in such a way that its groove will be made at one third of the length of the post from the main strut to the *chefat*, at the top level. This will support the radiating members of the roof by radiating from the post. Additional radiating members also added if the builder feels the addition is important. In all this process the continuous supervision of the builder is important to give corrections for the workers just visually. After the completion of this stage where the purpose of the scaffolding ends it will be removed so that the main struts will be positioned at a height of one third of the total length of the central post, where grooves are made for support purpose to transfer the roof load into the post then to the ground. He still keep telling me the next process in similar way as expressed in case of house unit '18'



House Units: 10

Ato Endale Kori owns this house unit, whose detail is expressed in compound 'K'. The old main house which is getting deteriorate is still functioning as a kitchen and a resting space. Since they don't have cattle they change the space in to storage. He prefers to stay in the tukul during day time. He also have the rectangular unit which is covered with corrugated iron sheet with three rooms the living, bed and storage rooms. This unit is finished with mud floor and covered with p.v.c. mat temporarily till they change it to cement screed floor finish and has a metal framed window and door with clear glass screen. He uses solar energy for his light and tape recorder. As Ato Endale explained these days the basic problem is not to build tukul units, but, it is that the scarcity of roof cover material which is thatch and also the cost they pay for local 'skilled' labors to build the unit is almost similar with the rectangular one, so as he said he prefer to build the '*korkoro*' house unit to get rest of the worries on maintenance every six years.

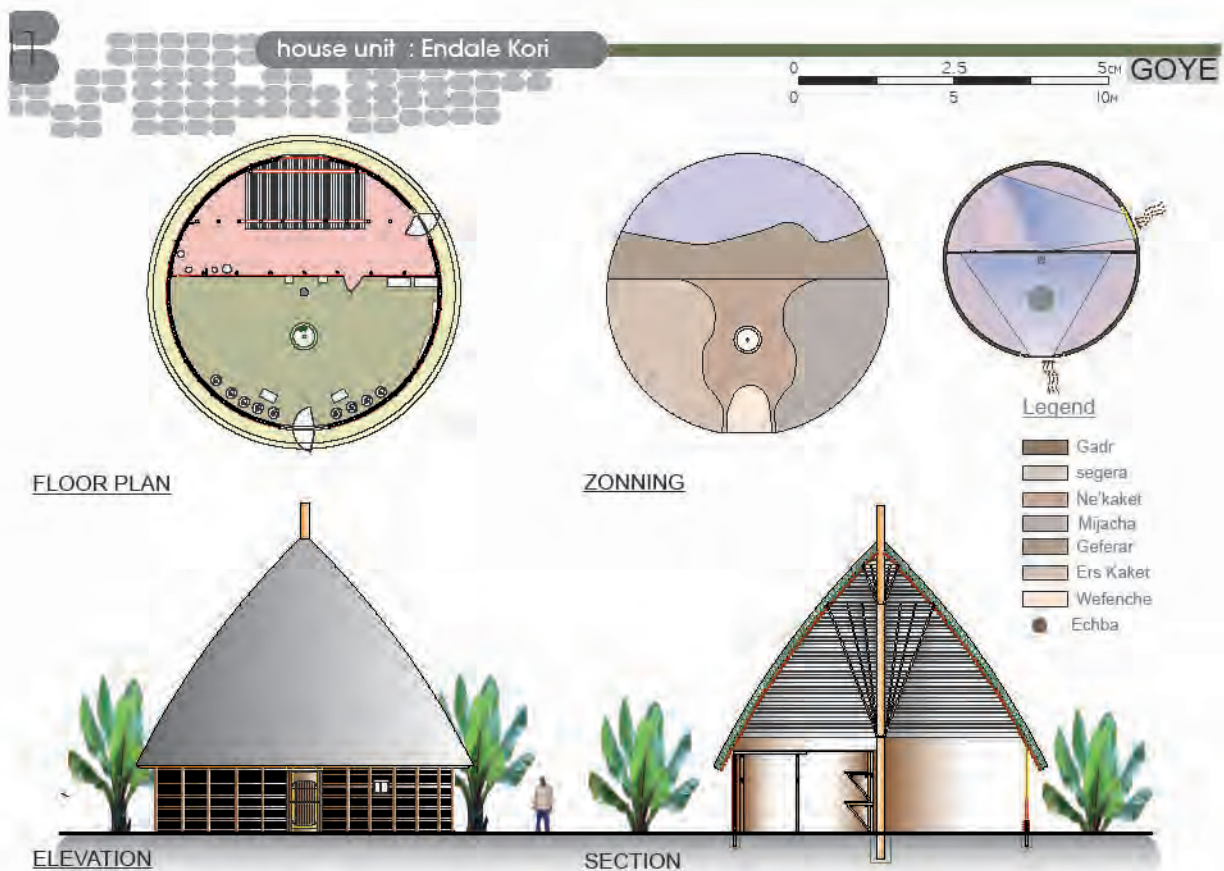


Figure 4.35 Graphical Analysis of House unit 10

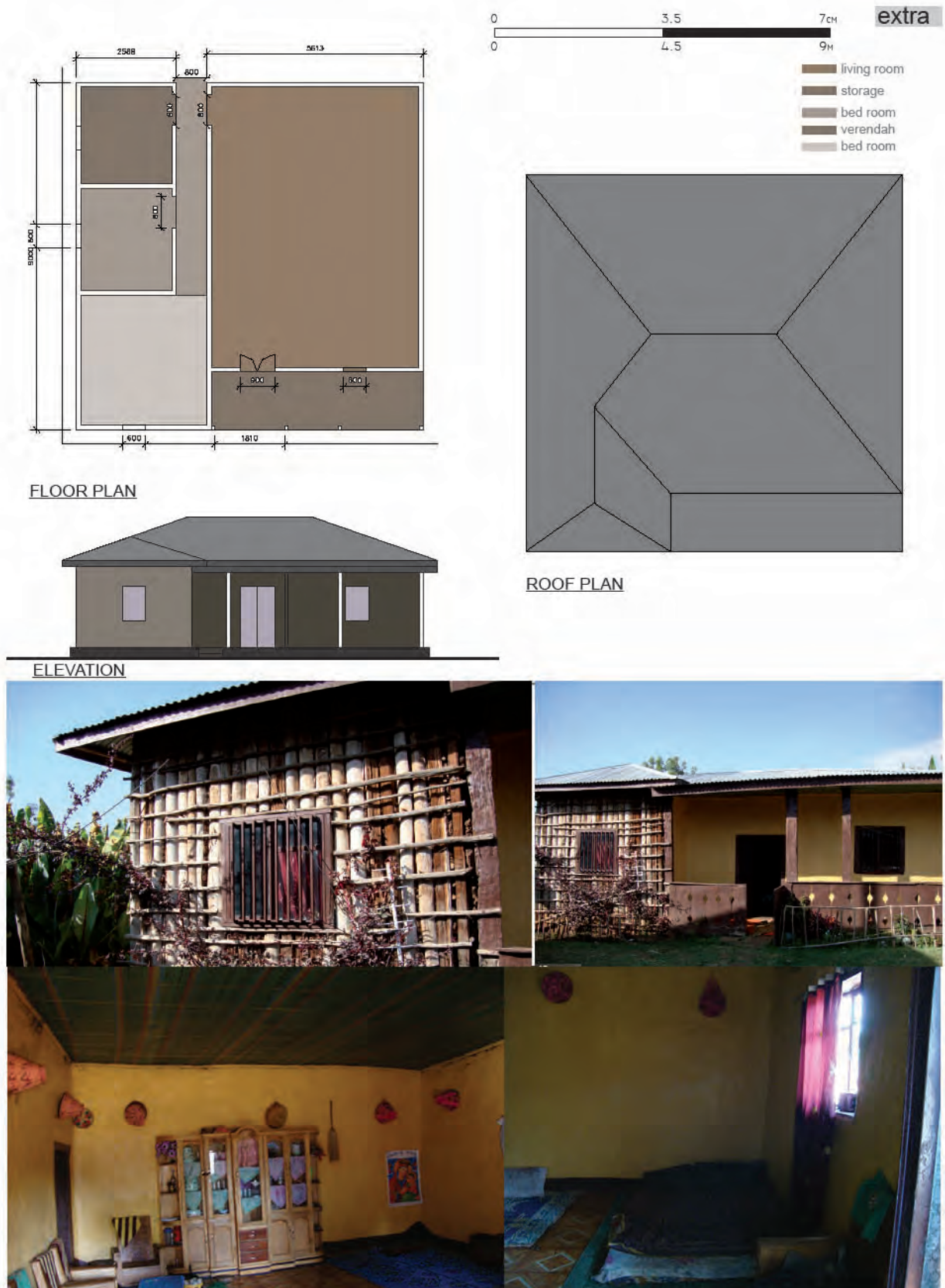


Figure 4.35.a. Graphical and Pictorial Analysis of House unit 10



Figure 4.35.b. Pictorial Analysis of House unit 10

Analysis at Gunchre

Settlement Wereped

Availability of Infrastructure

Gravel Road	Electricity	telephone	Clean water	Health post	Religious center	school	cemetery	Mill house
x	x	x	√	x	√	√	√	x

Intervening elements

Gravel Road	Electric lines	Communal Water Sup.	School	Kebele Office	Town Expansion	Irrigation channel
x	x	√	√	x	x	x

Nature of topography

Plain	Partially folded	Fully Folded
-	-	√

Starting generation

Current (First)	Second	Third	Fourth	Fifth	Sixth	More
-	-	-	√	-	-	-

Distance from center of nearby town/km

0 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6
		√			

No. of house units based on Google count (imagery date of Nov 6, 2006)

Thatch Circular	CIS Circular	CIS Square generated	Thatch Square generated
119	x	45	10

Table 4.04. Analysis of Settlement four

Compound analysis in case four

Number of house units within a compound

Quantity	One	Two	Three	Four	Five
Percentage	-	50%	50%	-	-

Front size of a compound in *wedero*

Size	Two	One and half	One	Half	Less
Percentage	-	-	100%	-	-

Owner Ship of a Compound

Owner ship	Private(single household)	Shared(multiple household)
Percentage	75%	25%

Fencing type

Type	None	Simple	strong
Percentage	25%	75%	-

Number households within a compound

Quantity	One	Two
Percentage	50%	50%

Availability of latrine pit

Availability	Available	Not available
Percentage	100%	-

Usage of backyard

Usage	(A) food source	(B) income source	(C) material source	A & B	A & C	A,B & C
Percentage	-	-	25%	25%	50%	-

Source of Energy

Sources	Wood and Kerosene	Electric and wood	Solar and wood
Percentage	80%	-	20%

Source of Water

Source	(A) Pumped water	(B) Ground water	(C) River	A and C	A,B & C
Percentage	-	-	-	100%	-

House unit Analysis of Case Four

House unit types in a compound based on purpose

House types	Goye	Goye and Herar	Goye and Zeger	Goye, Herar and Zeger	Goye, Herar, Zeger and Extra units
percentage	-	50%	-	50%	-

Shape and Roofing types

	Circular and thatch	Circular and CIS	Rectangular and thatch	Rectangular and CIS
Goye	75%	-	-	25%
Herar	100%	-	-	-
Zeger	20%		80%	-
Extra Unit	-	-	-	-

Wall Connecting Material

	(A) Nail	(B) Rubber	(C) Wedere	A&B	A&C	B&C
Goye	75%	-	-	25%	-	-
Herar	-	-	-	100%	-	-
Zeger	45%	-	-	-	55%	-
Extraunit	-	-	-	-	-	-

Structural connection method

	Only nailing	Rope, groove and socket	Others with nailing	Not available
Goye	75%	-	25%	-
Herar	25%	50%	25%	-
Zeger	80%	-	20%	-
Extra unit	-	-	-	

Income Source of a household

sources	(A) Children support	(B) farm	(C) Farm & business	A&B	A&C
percentage	25%	50%	-	25%	-

Usage of front fire place in goye

Frequency	Intensive	Occasional	Seldom	Never
Percentage	100%	0%	0%	-

Resource Accessibility

	Easy	Medium	Difficult	No
Thatch	75%	25%	-	-
Local builder	75%	25%	-	-

Number of doors

	One	Two	Three	More
Goye	-	25%	75%	-
Herar	25%	75%	-	-
Zeger	100%	-	-	-
Extra unit	-	-	-	-

Number of Window

	One	Two	Three	More
Goye	-	-	75%	25%
Herar	25%	25%	-	50%
Zeger	100%	-	-	-
Extra unit	-	-	-	-

Floor Finish material

	Traditional matt	PVC matt	Cow dung screed	Cement screed	None
Goye	25%	-	75%	-	-
Herar	100%	-	-	-	-
Zeger	-	-	-	-	100%
Extra units	-	-	-	-	-

Internal wall finish

	Mud plastering	Painted	Cow dung plastered	None
Goye	-	75%	25%	-
Herar	25%	50%	25%	-
Zeger	-	-	-	100%
Extra unit	-	-	-	-

External wall finish

	Wooden	Bamboo	Mud plastered	painting	None
Goye	25%	-	-	75%	-
Herar	75%	-	25%	-	-
Zeger	-	-	-	-	100%
Extra unit	-	-	-	-	-

Window types

	Wooden	Wooden frame with glass	Metal frame with glass	Bamboo	None
Goye	25%	50%	-	25%	-
Herar	25%	75%	-	-	-
Zeger	100%	-	-	-	-
Extra unit	-	-	-	-	-

Door type

	Wooden	Wooden frame with glass	Metal frame with glass	Bamboo	Not available
Goye	50%	-	50%	-	-
Herar	100%	-	-	-	-
Zeger	80%	-	-	20%	-
Extra unit	-	-	-	-	-

House unit size in diameter or equivalent

	10 to12m	8to10m	6to8m	4to6m	Less than 4m
Goye	-	100%	-	-	-
Herar	-	25%	50%	25%	-
Zeger	75%	-	-	25%	-
Extra unit	-	-	-	-	-

Conditions of Partitions

	Fully	Partially	Fractionally	none
Goye	75%	25%	-	-
Herar	-	75%	25%	-
Zeger	-	-	-	100%
Extra unit	-	-	-	

4.2.5. Case Five: Eshza Wereda (Close to Agena town)

Agena is the capital town of *Eshza wereda* which is located at a distance of 40km from *welkite* and 195km from Addis. Population composition of the *wereda* is 115,855 living in rural *kebeles* and 4726 living in town *kebeles* which gives a total of 120,581 populations in the *wereda*. The total land area coverage of the *wereda* is 43,130 hectare which is shared by 27 rural *kebeles* and one town *kebele*.



Guraghe zone wereda map

Figure 4.38. Location map of Case Five: Eshza Wereda (EMA + Overlays)

Settlement V: Desene Village Settlement

Desene settlement is located near to the capital town of the *wereda* which is *Agena* to the North West direction at a distance of 2km from the center of the town. It contains *Bideret* and *Kotchabit* got' which are at the end to midway and from midway to the beginning of the *Jefwere* from the main road respectively. *Bideret* got' contains around 31 households while *kotchabit* has 52 households based on the information from the dwellers of each got'. *Enset* is basic plantation in this settlement both for domestic use and also sometimes for income generation. The town is intruding its characters to this settlement from the Eastern direction. There is a gravel road which passes through this *jefwere* to a local church. There are also other services intervening in to this settlement like administrative office, health post, communal water pumper and elementary school all provisions inserted in to the *jefwere* without due consideration of the future.



Figure 4.39. Location map of Settlement Five (Google Earth + Overlays)
 Legend: CL- Compound L H11 - House unit eleven



Figure 4.40. Layout of Settlement five (Google Earth + Overlays)
 Legend: ■ - Rectangular house units ● - Traditional house units ■ - Single Compound

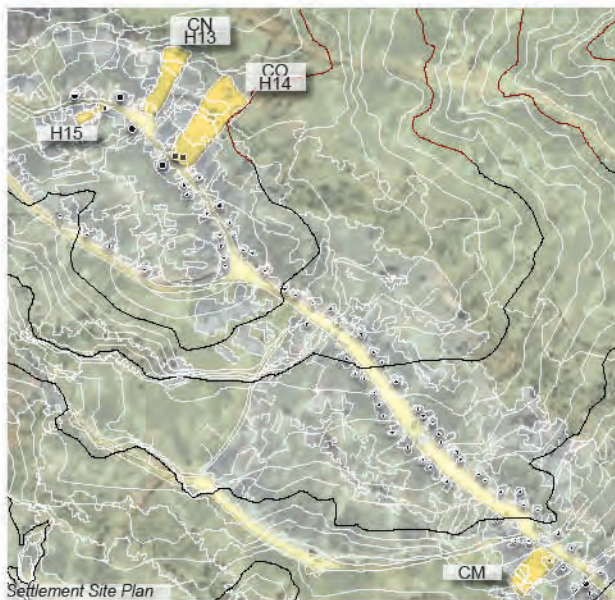


Figure 4.40.a. Pictorial analysis of Settlement five (Google Earth + Overlays and pictures)

Legend:

- - Rectangular house units
- - Traditional house units
- - Compound A

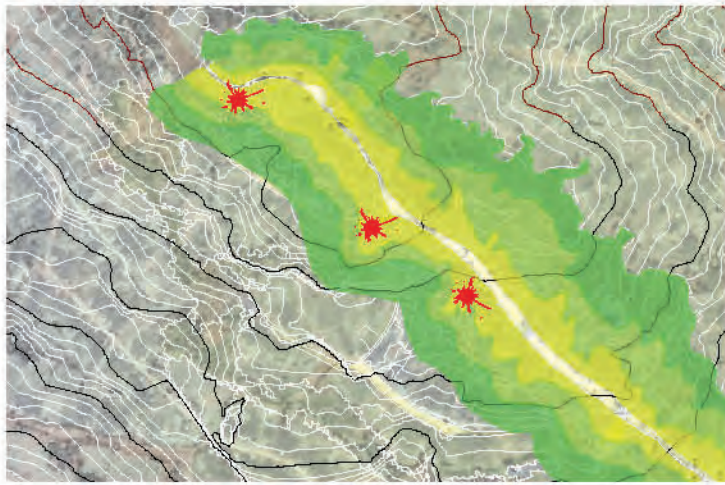
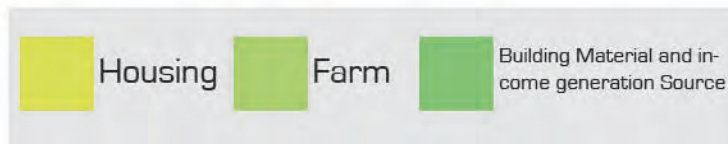


Figure 4.40.b. Land use map of settlement five (Google Earth + Overlays)

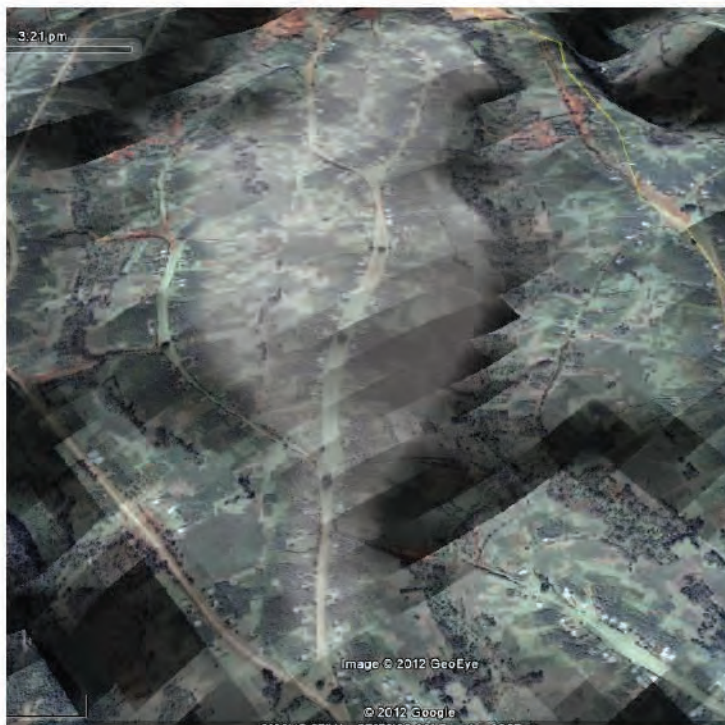


Figure 4.40.c. Topography of settlement five (Google Earth + Overlays)



Figure 4.40.d. Cross Section



Figure 4.40.e. Partial 3D of settlement Five.

Case 5
Compound N
Owner Mrfez Keterat

Number of houses 3
Front size of compound 39 m
Compound type 'private'



Compound: N

W/ro Mirfez Keterat is 65 years old and has three children. She lives in *Desene jefwere Bideret* got'. Her son Gebre Bereda also lives with her, taking responsibility from his father who passed away few years ago. There are three house units in the compound: the main house which is the old and big tukul which belongs to her and the old guest house which is now taken by her son Gebre and used as his main house unit. They are building *korkoro* bet in addition to what they have and it belongs to Gebre. He is married and has four children. He manage his family and his mother based on the farm product gained from the backyard. They produce *enset*, wheat, sorghum, *teff*, vegetables, fruits and others including those to be used as construction material. In their compound, Gebre himself, dug out the ground water by making a well of 28m deep. Which serves, the family and also neighbors in the village. They use wood as a source of fuel for cooking and heat generating, and also kerosene is used for lighting during night time.



Figure 4.42 Site Plan and picture of Compound N (Google Earth + Overlay and own picture)



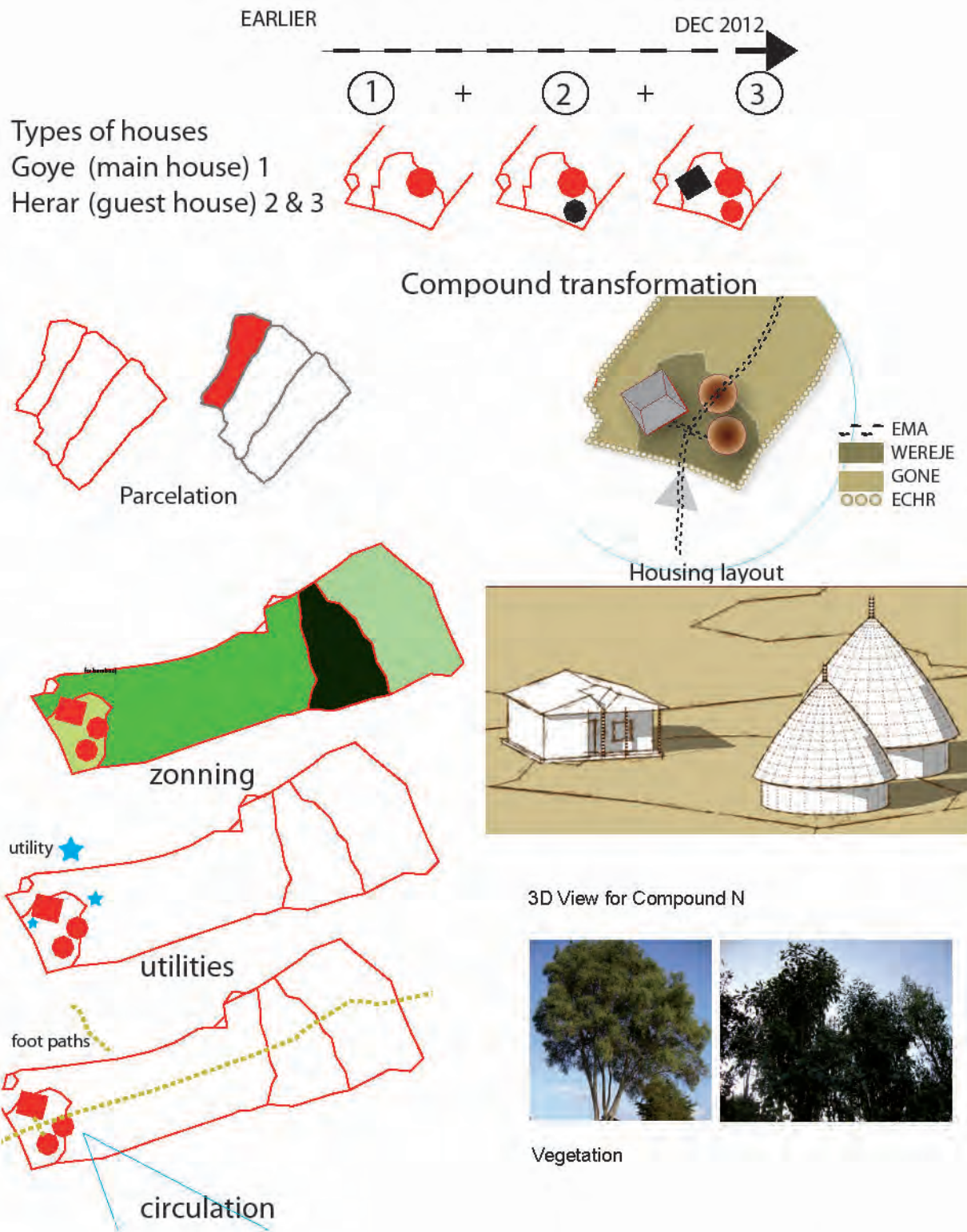


Figure 4.42.a. Graphical Analysis of Compound N





Figure 4.42.b. Pictorial
Analysis of Compound N

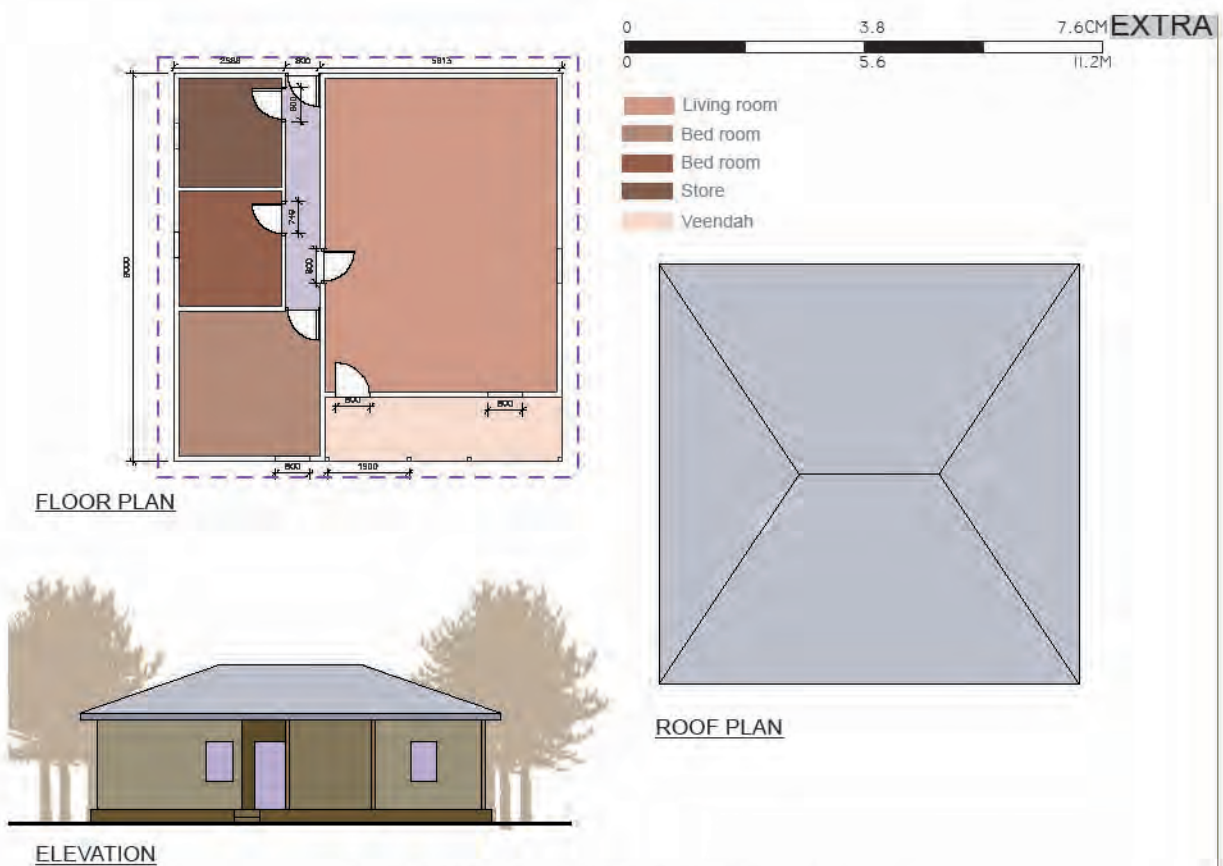
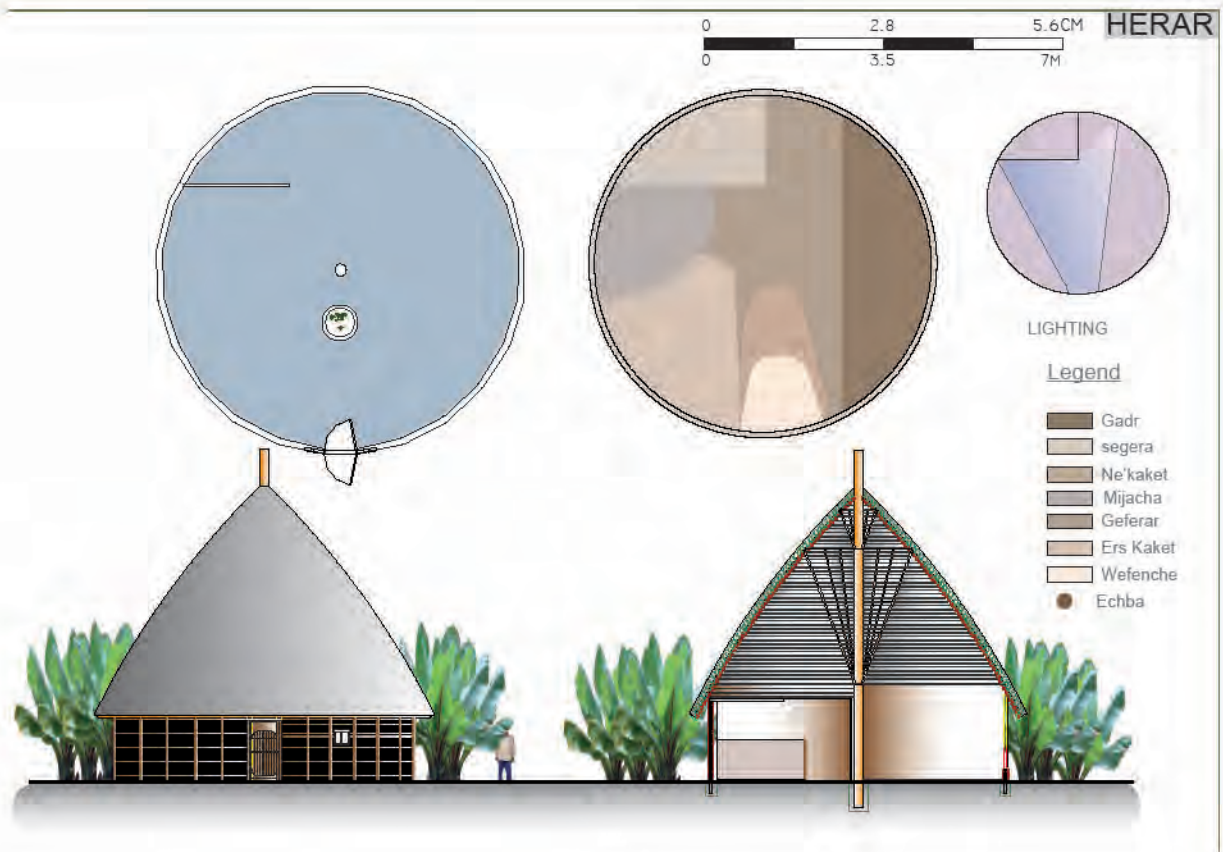


Figure 4.44.a. Graphical Analysis of House unit 13

Multi purpose space



Multi purpose space



Functional Fire place



Working vs cattle space



Giving shower



Wooden Cladding



Traditional Food preparation tools

Figure 4.44.b. Pictorial Analysis of House unit 13

Analysis at Agenna

Settlement Desene

Availability of Infrastructure

Gravel Road	Electricity	telephone	Clean water	Health post	Religious center	school	cemetery	Mill house
√	√	x	√	√	√	x	√	x

Intervening elements

Gravel Road	Electric lines	Communal Water Sup.	School	Kebele Office	Town Expansion	Irrigation channel
√	√	√	x	√	√	x

Nature of topography

Plain	Partially folded	Fully Folded
-	-	√

Starting generation

Current (First)	Second	Third	Fourth	Fifth	Sixth	More
-	-	-	√	-	-	-

Distance from center of nearby town/km

0 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6
	√				

No. of house units based on Google count (imagery date of Nov 6, 2006)

Thatch Circular	CIS Circular	CIS Square generated	Thatch Square generated
123	x	38	17

Table 4.05. Analysis of Settlement Five

Compound analysis in case Five

Number of house units within a compound

Quantity	One	Two	Three	Four	Five
Percentage	14%	43%	43%	-	-

Front size of a compound in *wedero*

Size	Two	One and half	One	Half	Less
Percentage	-	16%	67%	17%	-

Owner Ship of a Compound

Owner ship	Private(single household)	Shared(multiple household)
Percentage	57%	43%

Fencing type

Type	None	Simple	strong
Percentage	-	14%	86%

Number households within a compound

Quantity	One	Two
Percentage	57%	43%

Availability of latrine pit

Availability	Available	Not available
Percentage	100%	-

Usage of backyard

Usage	(A) food source	(B) income source	(C) material source	A & B	A & C	A,B & C
Percentage	-	-	14%	29%	57%	-

Source of Energy

Sources	Wood and Kerosene	Electric and wood	Solar and wood
Percentage	86%	14%	-

Source of Water

Source	(A) Pumped water	(B) Ground water	(C) River	A and C	A,B & C
Percentage	-	-	-	-	100%

House unit Analysis of Case Five

House unit types in a compound based on purpose

House types	Goye	Goye and Herar	Goye and Zeger	Goye, Herar and Zeger	Goye, Herar, Zeger and Extra units
percentage	14%	57%	-	29%	-

Shape and Roofing types

	Circular and thatch	Circular and CIS	Rectangular and thatch	Rectangular and CIS
Goye	86%	-	-	14%
Herar	25%	14%	-	61%
Zeger	14%	-	86%	-
Extra Unit	-	-	-	-

Wall Connecting Material

	(A) Nail	(B) Rubber	(C) Wedere	A&B	A&C	B&C
Goye	14%	-	14%	-	72%	-
Herar	57%	-	-	-	29%	14%
Zeger	57%	-	-	-	43%	-
Extraunit	-	-	-	-	-	-

Structural connection method

	Only nailing	Rope, groove and socket	Others with nailing
Goye	14%	43%	43%
Herar	71%	15%	14%
Zeger	57%	14%	29%
Extra unit	-	-	-

Income Source of a household

sources	(A) Children support	(B) farm	(C) Farm & business	A&B	A&C
percentage	14%	28%	29%	29%	-

Usage of front fire place in goye

Frequency	Intensive	Occasional	Seldom	Never
Percentage	57%	29%	14%	-

Resource Accessibility

	Easy	Medium	Difficult	No
Thatch	86%	14%	-	-
Local builder	57%	43%	-	-

Number of doors

	One	Two	Three	More
Goye	-	57%	43%	-
Herar	15%	14%	57%	14%
Zeger	100%	-	-	-
Extra unit	-	-	-	-

Number of Window

	One	Two	Three	More	None
Goye	29%	14%	-	57%	
Herar	-	57%	14%	29%	
Zeger	-	-		-	100%
Extra unit	-	-		-	

Floor Finish material

	Traditional matt	PVC matt	Cow dung screed	Cement screed	None
Goye	86%	14%	-	-	-
Herar	43%	14%	29%	14%	-
Zeger	-	-	29%	-	71%
Extra units	-	-	-	-	-

Internal wall finish

	Mud plastering	Painted	Cow dung screed	None
Goye	71%	29%	-	-
Herar	71%	-	29%	
Zeger	-	-	71%	29%
Extra unit	-	-	-	-

External wall finish

	Wooden	Bamboo	Mud plastered	painting	Not available
Goye	29%	57%	-	14%	-
Herar	14%	14%	14%	29%	29%
Zeger	14%	-	-	43%	43%
Extra unit	-	-	-	-	-

Window types

	Wooden	Wooden frame with glass	Metal frame with glass	Bamboo	None
Goye	43%	14%	-	43%	-
Herar	14%	57%	-	29%	-
Zeger	-	-	-	-	100%
Extra unit	-	-	-	-	-

Door type

	Wooden	Wooden frame with glass	Metal frame with glass	Bamboo
Goye	86%	-	14%	-
Herar	43%	28%	29%	-
Zeger	43%	-	-	57%
Extra unit	-	-	-	-

House unit size in diameter or equivalent

	10 to12m	8to10m	6to8m	4to6m	Less than 4m
Goye	14%	86%	-	-	-
Herar	29%	-	57%	14%	-
Zeger	-	-	-	57%	43%
Extra unit	-	-	-	-	-

Conditions of Partitions

	Fully	Partially	Fractionally	None
Goye	14%	43%	43%	-
Herar	57%	14%	-	29%
Zeger	-	-	-	100%
Extra unit	-	-	-	-

4.2.6. Case Six: *Muhur and Aklil Wereda* (Close to *Hawaryat* town)

Hawaryat is located at a distance of 52km from *welkite* and 207km from Addis which is the capital town of the *wereda* which covers 42,120 hectare area of land shared by 29 rural *kebeles* and one town *kebele*. It has a population of 118,464 of which 116,117 lives in rural *kebeles* and 2,347 lives in town *kebeles*. Climate condition of *Muhur and Aklil Wereda* categorized in to 44.4% *weynadega* and 55.6% *dega* and the altitude ranges from 1500m to 3396m above sea level.



Guraghe zone wereda map

Figure 4.47. Location map of Case Six: *Muhur and Aklil Wereda* (EMA + Overlays)

Settlement VI: *Dedegba Village Settlement*

It is a resented settlement which was established in late 1920s by 10 households including the grandfather of Haile *Gonchye* who is 71 years old. The *jefwere* took the center and top part of the ridge topography. There are around 30 households in this village settlement. It is located at a distance of 1.5km to the South of the newly established town *Hawaryat*. Based on Ato Haile *Gonchyes'* interview most households in this settlement lead their life through agriculture. At the top elevation of this settlement they manage to dig out ground water with the help of government they start to pump it out and utilize it as irrigation channel for all compounds which flows with naturally to the lower elevation point.



Figure 4.48. Location map of Settlement Six (Google Earth + Overlays)
 Legend: CP- Compound P H18 - House unit eighteen

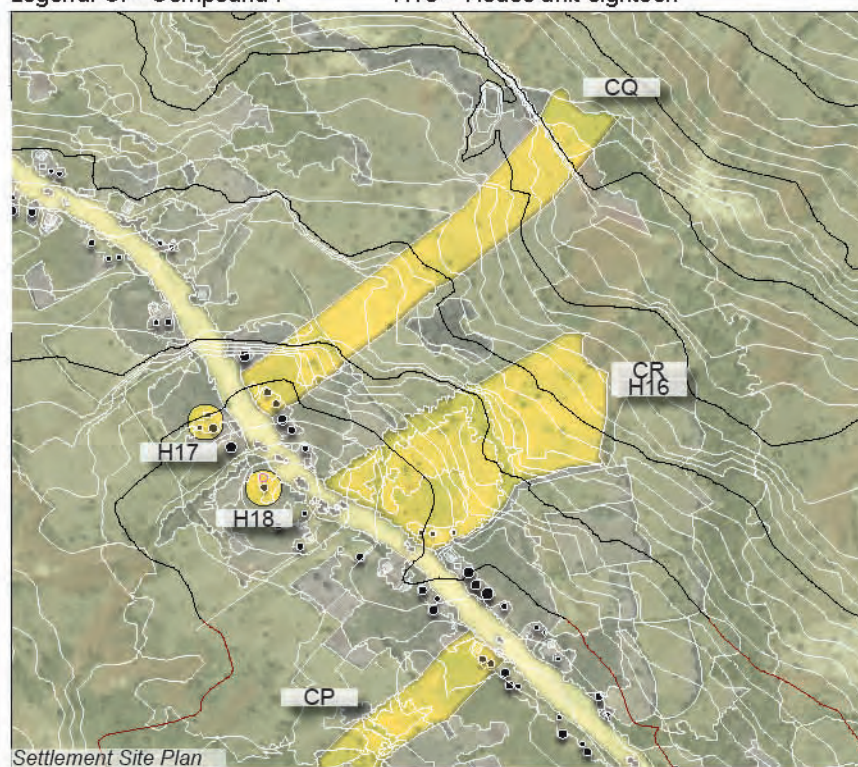


Figure 4.49. Layout of Settlement six (Google Earth + Overlays)
 Legend: ■ - Rectangular house units ● - Traditional house units ■ - Single Compound



Figure 4.49.a. Pictorial analysis of Settlement six (Google Earth + Overlays and pictures)

Legend:

- - Rectangular house units
- - Traditional house units
- - Compound A

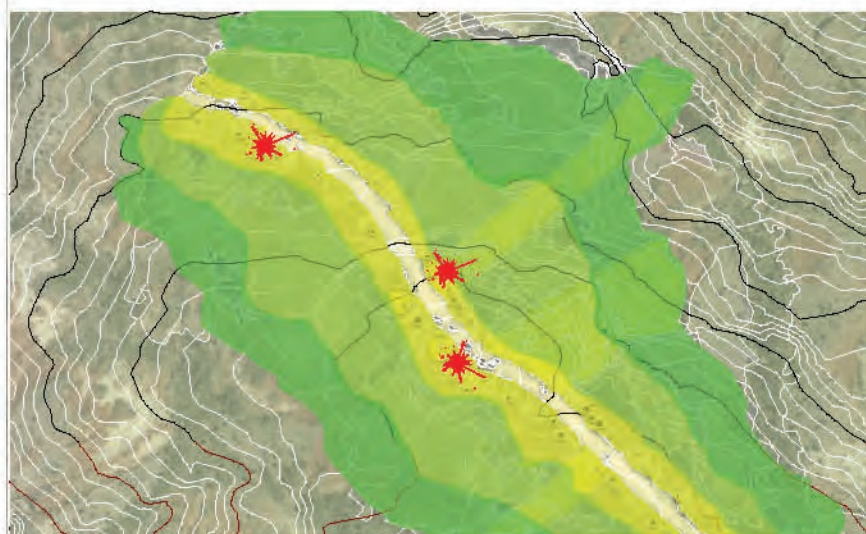
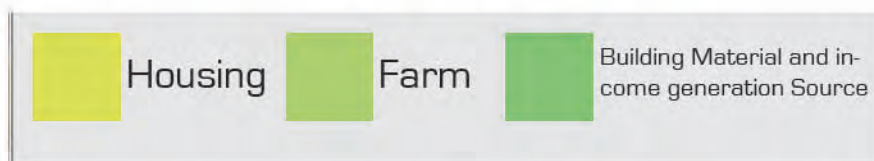


Figure 4.49.b. Land use map of settlement six (Google Earth + Overlays)

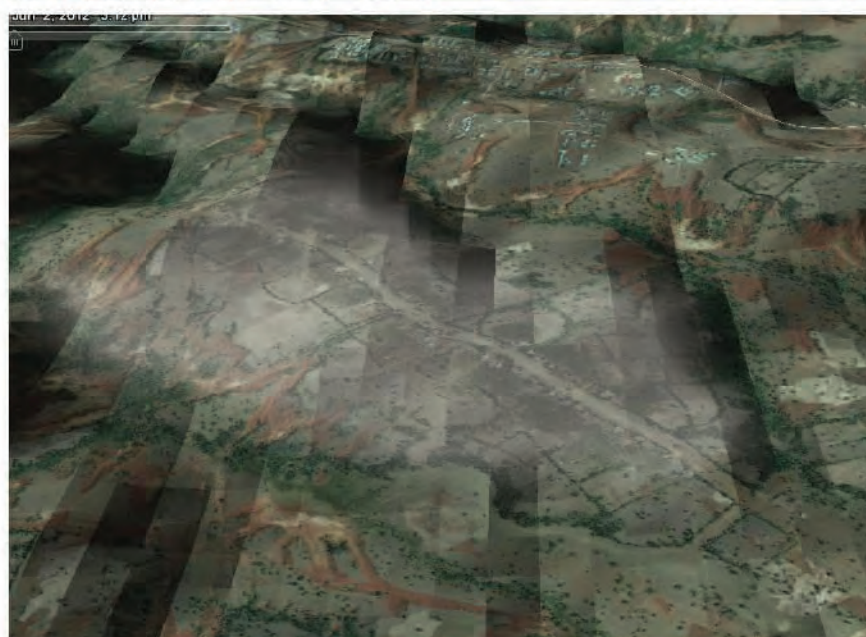


Figure 4.49.c. Topography of settlement six (Google Earth + Overlays)



Figure 4.49.d. Cross Section



Figure 4.49.e. Partial 3D of settlement six.

Case 6
Compound R
Owner Kibebew Kifle

Number of houses 4
Front size of compound 166 m
Compound type 'shared'



Compound: R

Memhre Kibebew Kifle is a priest in saint marry church near his village and also a farmer. He is 40, married and has four children. He received two *wedero* land from his old parents as he is the only son they have. He live with in shared compound with his parents supporting and helping them in the farm work taking all the responsibility. In this compound including his parents units there are four housing units of which one is a rectangular unit covered with CIS and made to serve as a guest house the other three are tukuls which serves as one as a main house for his parents, one as a common kitchen and store and the other one is his own main house. He basically produces *enset*, fruits, chat, coffee and vegetables. He owns five cows from which two are milk cows. He incorporates latrine pit in his backyard. Since there is no electric supply in the settlement he uses kerosene to generate light during night time. Major source of fuel is wood which used for cooking and generating heat.

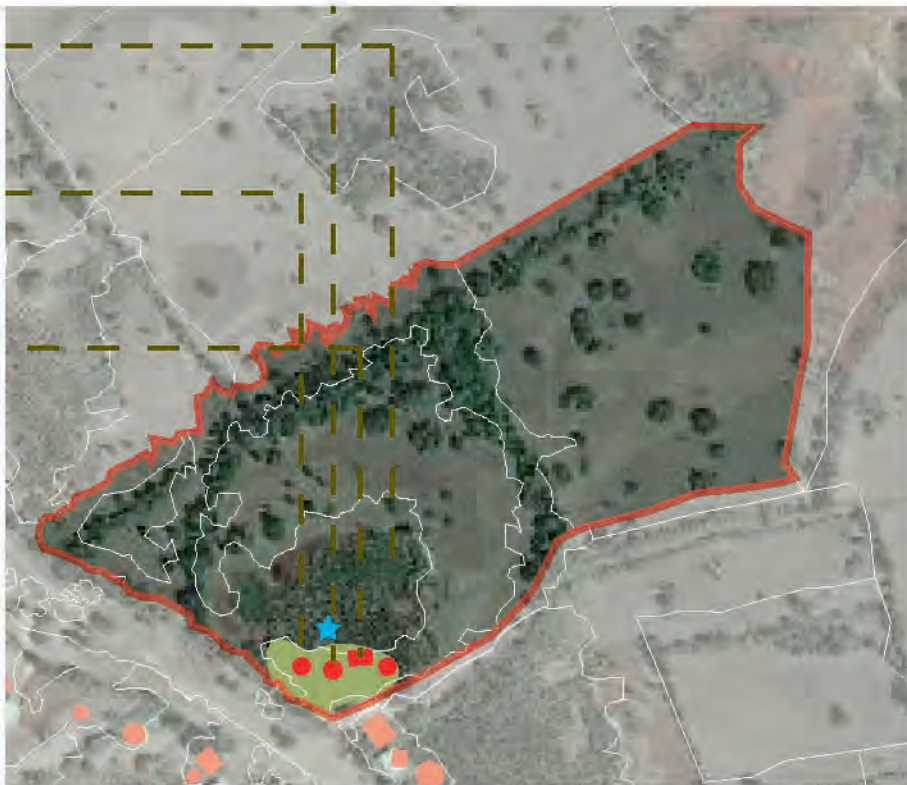


Figure 4.52. Site Plan of Compound R (Google Earth + Overlay)

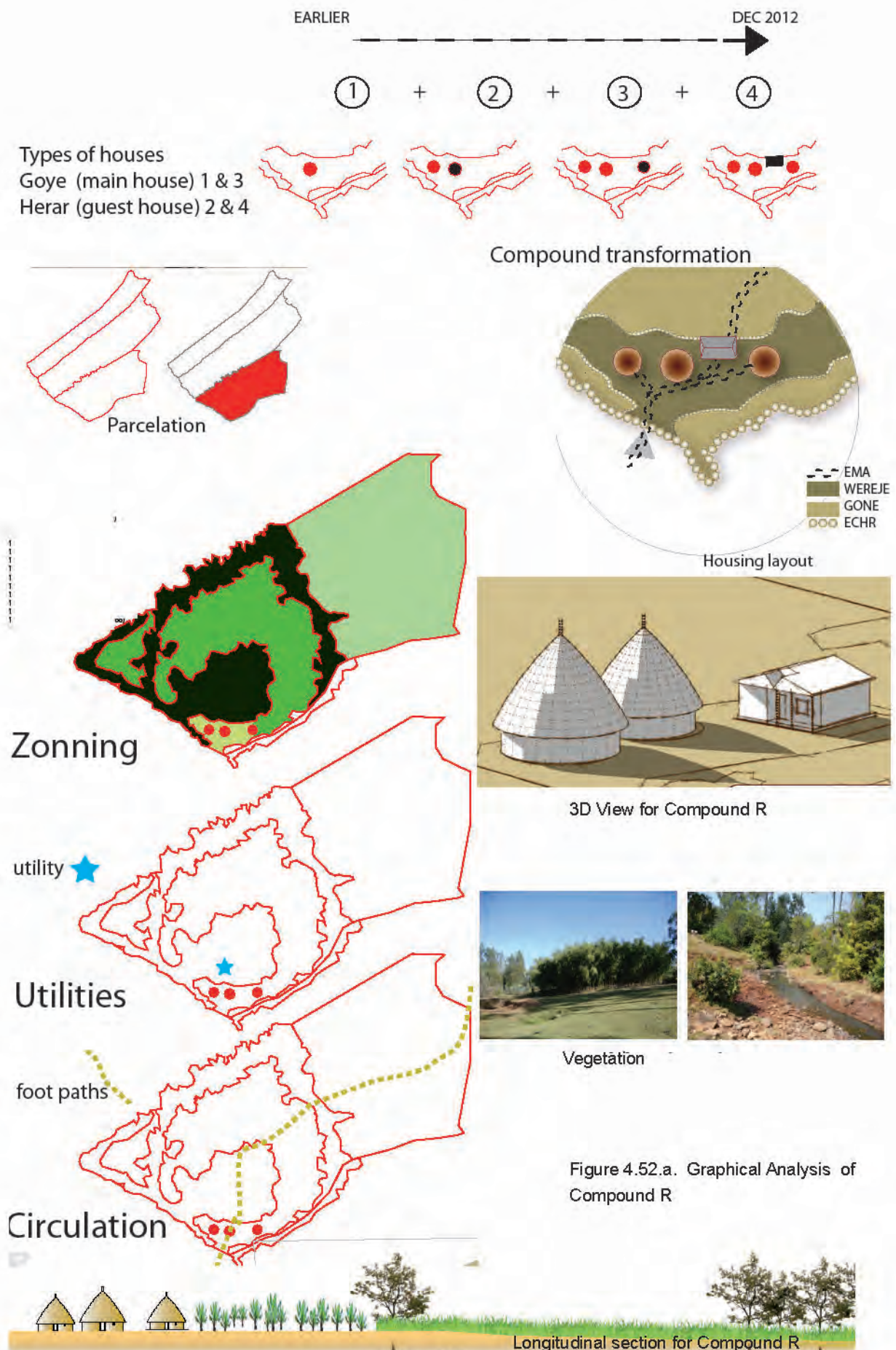


Figure 4.52.a. Graphical Analysis of Compound R



Figure 4.52.b. Pictorial Analysis of
Compound R

House Units: 18



A new house is being built in *ginab* village, while the researcher was on data collection, from w/ro Yechanesh Hailu who is 28 years old and has three children. She came to this village through marriage eight years ago. Before her husband marry her, he used to live with his parents in their units till they pass away after which he get married and start to live in the house which was built long a go by his parents. But currently it is in a bad condition so they started the construction process of a new house before two years which is still not finished, so they have to proceed using the old house unit until they finish the new one. It was on the stage of completion of the roof structure. The old unit is the only unit they have and they use it as their main house containing multipurpose spaces like, socializing space, sleeping space, cooking space, storage space and a barn space. She uses wood and kerosene as a source of energy to generate heat for cooking and lighting.

Summary of interview with traditional builder of W/ro Yechanesh Hailus' new tukul unit

Ato Melis was doing the construction of her new tukul where currently is on the completion stage of roofing structure, though he discussed all the process, to avoid redundancy of information I will continue from the description given in compound 'J'. As he explained after forming the radiating main struts to support the roofing system the next step is covering the roof top with thatch. Thatching has two detail in tradition as he explained the *gyegyerye* and *sotye*, the first one is preferred but consumes a lot of resource, both material and labor, which is the case where the end towards the root of the thatch is exposed outside and the tip goes inside to be tied with the roof member and the majority of the thatches' portion is overlapped with the preceding layer in order to create thick layer. And the other one is positioned in opposite manner and it creates thin layer than the first one. Thatching starts from bottom to top and constructed spirally. He is also given a contract to make the door, window and *agdata* details also details for *kote*, *nequoche* where the *gadr* is placed. And the rest of the work will be left for the owner which is plastering, furnishing, decorating etc. Since my focus is also on the transformation I ask him to tell me where the major changes are if there are and he started with the change in connecting materials as it is changed from rope (*wedere*, *katcha*, *creeper*) to nails which is started to be applied on the wall, door connections, and also on radiating struts of the central post. The other change is number of doors increases from one to two. As he remembers the old layout was not nice like these days because there was no partition as it is right now. There are also additions of windows etc. I ask him that, are these changes your recommendations or it comes from the clients need? He explained that in most cases it comes from the clients because these changes are related with financial capability of the owner.

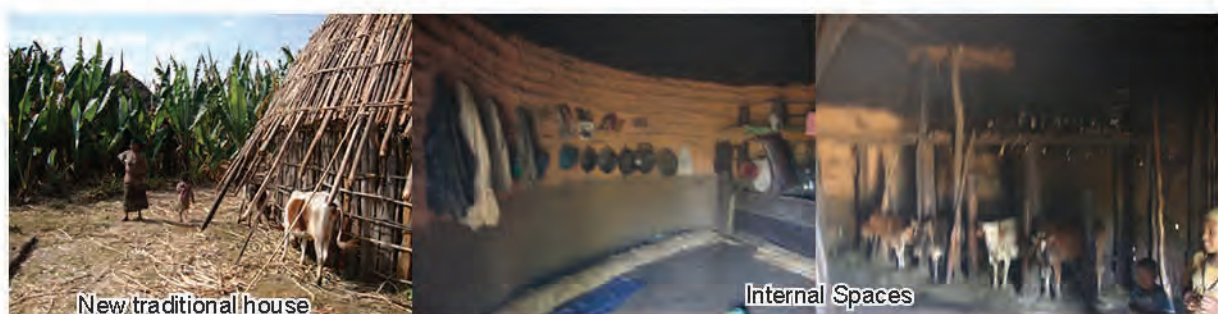
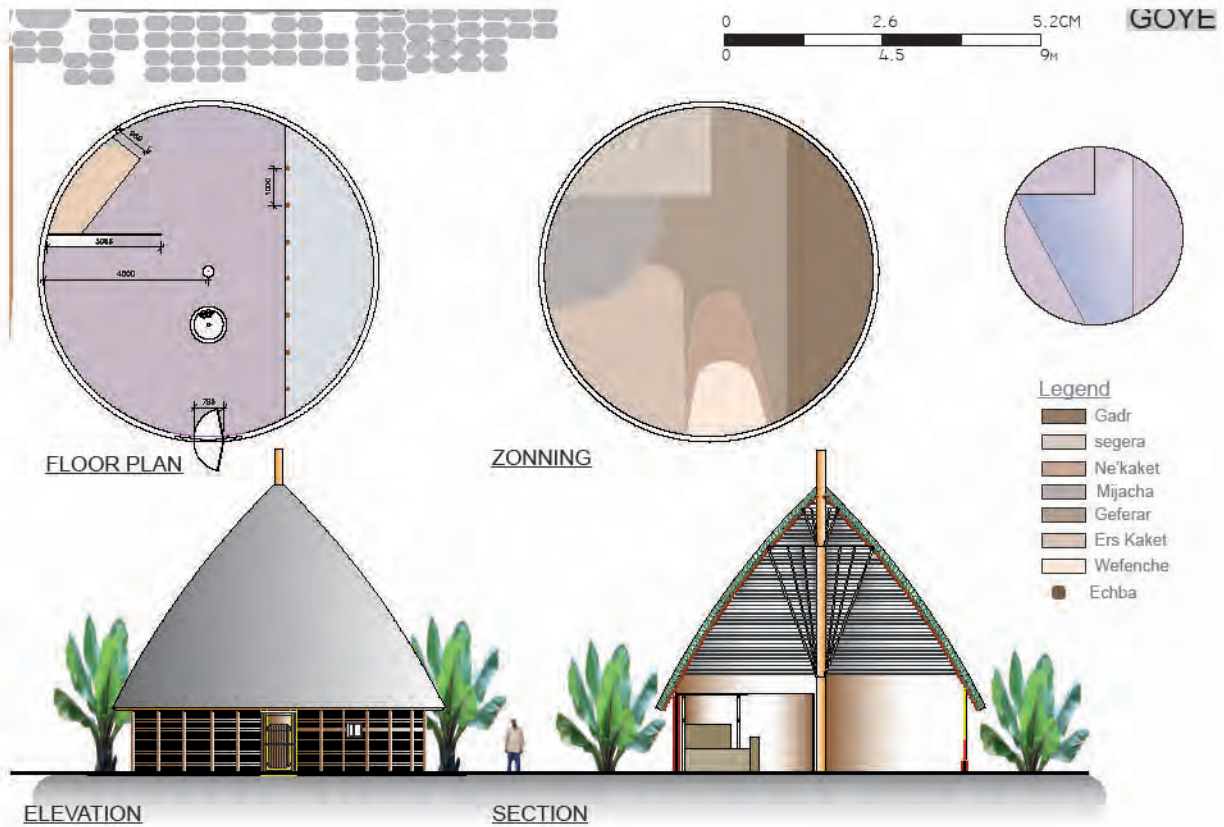


Figure 4.55. Graphical and Pictorial Analysis of House unit 18



Figure 4.55.a. Pictorial Analysis of House unit 18

Analysis at Hawariyat

Settlement Ginab

Availability of Infrastructure

Gravel Road	Electricity	telephone	Clean water	Health post	Religious center	school	cemetery	Mill house
x	x	x	√	x	√	x	√	x

Intervening elements

Gravel Road	Electric lines	Communal Water Sup.	School	Kebele Office	Town Expansion	Irrigation channel
x	x	√	x	x	x	√

Nature of topography

Plain	Partially folded	Fully Folded
-	-	√

Starting generation

Current (First)	Second	Third	Fourth	Fifth	Sixth	More
-	-	-	√	-	-	-

Distance from center of nearby town /km

0 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6
		√			

No. of house units based on Google count (imagery date of Nov 6, 2006)

Thatch Circular	CIS Circular	CIS Square generated	Thatch Square generated
65	x	19	2

Table 4.06. Analysis of Settlement Six

Compound analysis in case six

Number of house units within a compound

Quantity	One	Two	Three	Four	Five
Percentage	10%	37%	37%	11%	5%

Front size of a compound in *wedero*

Size	Two	One and half	One	Half	Less
Percentage	5%	10%	21%	53%	11%

Owner Ship of a Compound

Owner ship	Private(single household)	Shared(multiple household)
Percentage	74%	26%

Fencing type

Type	None	Simple	strong
Percentage	16%	53%	31%

Number households within a compound

Quantity	One	Two
Percentage	74%	26%

Availability of latrine pit

Availability	Available	Not available
Percentage	100%	-

Usage of backyard

Usage	(A) food source	(B) income source	(C) material source	A & B	A & C	A,B & C
Percentage	-	-	16%	26%	58%	-

Source of Energy

Sources	Wood and Kerosene	Electric and wood	Solar and wood
Percentage	100%	-	-

Source of Water

Source	(A) Pumped water	(B) Ground water	(C) River	A and C	A,B & C
Percentage	-	-	-	-	100%

House unit Analysis of Case Six

House unit types in a compound based on purpose

House types	Goye	Goye and Herar	Goye and Zeger	Goye, Herar and Zeger	Goye, Herar, Zeger and Extra units
percentage	5%	53%	16%	26%	-

Shape and Roofing types

	Circular and thatch	Circular and CIS	Rectangular and thatch	Rectangular and CIS
Goye	100%	-	-	-
Herar	21%	21%	-	58%
Zeger	26%	58%	5%	11%
Extra Unit	-	-	-	-

Wall Connecting Material

	(A) Nail	(B) Rubber	(C) Wedere	A&B	A&C	B&C	A,B,& C
Goye	26%	-	16%	-	58%	-	-
Herar	52%	-	-	-	47%	-	21%
Zeger	5%	-	16%	-	21%	-	58%
Extraunit	-	-	-	-	-	-	-

Structural connection method

	Only nailing	Rope, groove and socket	Others with nailing	Not available
Goye	-	84%	16%	-
Herar	52%	16%	32%	-
Zeger	42%	6%	52%	-
Extra unit	-	-	-	-

Income Source of a household

sources	(A) Children support	(B) farm	(C) Farm & business	A&B	A&C
percentage	37%	26%	21%	26%	-

Usage of front fire place in goye

Frequency	Intensive	Occasional	Seldom	Never
Percentage	63%	32%	5%	-

Resource Accessibility

	Easy	Medium	Difficult	None
Thatch	53%	26%	21%	-
Local builder	31%	53%	16%	-

Number of doors

	One	Two	Three	More
Goye	31%	16%	53%	-
Herar	11%	47%	26%	16%
Zeger	100%	-	-	-
Extra unit	-	-	-	-

Number of Window

	One	Two	Three	More	None
Goye	10%	16%	11%	63%	-
Herar	11%	47%	42%	-	-
Zeger	35%	-	-	-	65%
Extra unit	-	-	-	-	-

Floor Finish material

	Traditional matt	PVC matt	Cow dung screed	Cement screed	None
Goye	74%	21%	-	5%	-
Herar	31%	21%	16%	32%	-
Zeger	-	-	42%	-	58%
Extra units	-	-	-	-	-

Internal wall finish

	Mud plastering	Painted	Cow dung screed	None
Goye	-	26%	74%	-
Herar	5%	42%	32%	21%
Zeger	-	-	-	100%
Extra unit	-	-	-	-

External wall finish

	Wooden	Bamboo	Mud plastered	painting	None
Goye	21%	79%	-	-	-
Herar	31%	37%	16%	16%	-
Zeger	-	-	-	-	100%
Extra unit	-	-	-	-	-

Window types

	Wooden	Wooden frame with glass	Metal frame with glass	Bamboo	None
Goye	68%	-	-	32%	-
Herar	47%	42%	-	11%	-
Zeger	78	-	-	22%	-
Extra unit	-	-	-	-	-

Door type

	Wooden	Wooden frame with glass	Metal frame with glass	Bamboo
Goye	100%	-	-	-
Herar	58%	-	21%	21%
Zeger	42%	-	-	58%
Extra unit	-	-	-	-

House unit size in diameter or equivalent

	10 to12m	8to10m	6to8m	4to6m	Less than 4m
Goye	26%	63%	11%	-	-
Herar	21%	32%	37%	10%	-
Zeger	-	-	-	58%	42%
Extra unit	-	-	-	-	-

Conditions of Partitions

	Fully	Partially	Fractionally	none
Goye	-	58%	42%	-
Herar	21%	16%	42%	21%
Zeger	-	-	-	100%
Extra unit	-	-	-	-

4.3. Cross Case Analysis

Settlement

Availability of Infrastructure and services

Cases	Gravel Road	Electricity	Telephone line	Clean water	Health post	Religious center	school	cemetery	Mill house
One	√	√	x	√	x	√	x	X	x
Two	√	√	x	√	√	X	√	X	√
Three	x	x	x	x	x	X	x	X	x
Four	x	x	x	√	x	√	√	X	x
Five	√	√	x	√	√	√	x	X	x
Six	x	x	x	√	x	X	x	X	x

Intervening elements

Cases	Gravel Road	Electric lines	Communal Water Sup.	School	Kebele Office	Town Expansion	Irrigation/drainage channel
One	√	√	x	x	x	x	x
Two	√	√	√	√	x	√	x
Three	x	x	x	x	x	x	x
Four	x	x	√	√	x	x	x
Five	√	√	√	x	√	√	√
Six	x	x	√	x	x	x	√

No. of house units based on Google count (imagery date of Nov 6, 2006)

Cases	Thatch Circular	CIS Circular	CIS Square generated	Thatch Square generated	Total house units
One	34	x	15	6	55
Two	37	1	10	x	48
Three	120	x	10	x	130
Four	119	x	45	10	174
Five	123	x	38	17	178
Six	65	x	19	2	86

Table 4.07. Cross case Analysis of the Six Settlement

Nature of topography

Cases	Plain	Partially folded	Fully Folded
One	-	-	√
Two	-	√	-
Three	-	-	√
Four	-	-	√
Five	-	√	-
Six	-	-	√

Starting generation

Cases	Current (First)	Second	Third	Fourth	Fifth	Sixth	More
One	-	-	-	√	-	-	-
Two						√	
Three					√		
Four				√			
Five						√	
Six				√			

Distance from center of nearby town /km

Cases	0 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6
One					√	
Two	√					
Three						√
Four				√		
Five		√				
Six				√		

Cross Case Compound analysis

Number of house units within a compound

Quantity	One	Two	Three	Four	Five
Percentage	7%	41%	39%	7%	6%

Front size of a compound in wedero

Size	Two	One and half	One	Half	Less
Percentage	2%	11%	40%	41%	6%

Owner Ship of a Compound

Owner ship	Private(single household)	Shared(multiple household)
Percentage	67%	33%

Fencing type

Type	None	Simple	strong
Percentage	11%	41%	48%

Number households within a compound

Quantity	One	Two
Percentage	70%	30%

Availability of latrine pit

Availability	Available	Not available
Percentage	100%	-

Usage of backyard

Usage	(A) food source	(B) income source	(C) material source	A & B	A & C	A,B & C
Percentage	-	-	-	11%	30%	59%

Source of Energy

Sources	Wood and Kerosene	Electric and wood	Solar and wood
Percentage	78%	17%	5%

Source of Water

Source	(A) Pumped water	(B) Ground water	(C) River	A and C	A,B & C
Percentage	-	-	-	74%	26%

Cross Case House unit Analysis

House unit types in a compound based on purpose

House types	Goye	Goye and Herar	Goye and Zeger	Goye, Herar and Zeger	Goye, Herar, Zeger and Extra units
percentage	7%	14%	22%	43%	14%

Shape and Roofing types

	Circular and thatch	Circular and CIS	Rectangular and thatch	Rectangular and CIS
Goye	89%	2%	-	9%
Herar	35%	-	-	65%
Zeger	37%	-	42%	21%
Extra Unit	-	-	25%	75%

Wall Connecting Material

	(A) Nail	(B) Rubber	(C) Wedere	A&B	A&C	B&C	A,B,& C
Goye	26%	-	24%	-	40%	-	10%
Herar	32%	-	8%	-	34%	-	26%
Zeger	36%	-	21%	-	14%	-	29%
Extra unit	17%	-	-	-	83%	-	-

Structural connection method

	Only nailing	Rope, groove and socket	Others with nailing	Not available
Goye	3%	89%	8%	-
Herar	44%	33%	23%	-
Zeger	42%	21%	37%	-
Extra unit	5%	-	95%	-

Income Source of a household

sources	(A) Children support	(B) farm	(C) Farm & business	A&B	A&C
percentage	12%	36%	23%	19%	10%

Usage of front fire place in goye

Frequency	Intensive	Occasional	Seldom	Never
Percentage	55%	31%	7%	7%

Resource Accessibility

	Easy	Medium	Difficult	No
Thatch	11%	23%	62%	4%
Local builder	12%	38%	50%	-

Number of doors

	One	Two	Three	More
Goye	12%	15%	69%	4%
Herar	18%	20%	25%	37%
Zeger	100%	-	-	-
Extra unit	-	14%	20%	66%

Number of Window

	One	Two	Three	None
Goye	15%	12%	23%	50%
Herar	15%	23%	28%	34%
Zeger	8%	-	-	92%
Extra unit	4%	4%	92%	-

Floor Finish material

	Traditional matt	PVC matt	Cow dung screed	Cement screed	None
Goye	92%	-	8%	-	-
Herar	37%	16%	14%	33%	-
Zeger	-	-	54%	-	46%
Extra units	-	-	57%	43%	-

Internal wall finish

	Mud plastering	Painted	Cow dung screed	None
Goye	4%	58%	38%	-
Herar	8%	72%	20%	-
Zeger	35%	-	-	65%
Extra unit	38%	54%	4%	4%

External wall finish

	Wooden	Bamboo	Mud plastered	painting	None
Goye	42%	53%	-	5%	-
Herar	23%	34%	23%	20%	-
Zeger	42%	-	-	-	58%
Extra unit	16%	-	45%	39%	-

Window types

	Wooden	Wooden frame with glass	Metal frame with glass	Bamboo	None
Goye	60%	2%	-	38%	-
Herar	50%	21%	18%	11%	-
Zeger	40%	-	-	60%	-
Extra unit	49%	31%	20%	-	-

Door type

	Wooden	Wooden frame with glass	Metal frame with glass	Bamboo
Goye	98%	-	2%	-
Herar	68%	-	23%	9%
Zeger	76%	-	-	24%
Extra unit	63%	-	37%	-

House unit size in diameter or equivalent

	10 to12m	8to10m	6to8m	4to6m	Less than 4m
Goye	29%	67%	4%	-	-
Herar	27%	20%	40%	13%	-
Zeger	-	-	2%	18%	80%
Extra unit	75%	2%	15%	8%	-

Conditions of Partitions

	Fully	Partially	Fractionally	none
Goye	4%	67%	29%	-
Herar	33%	29%	29%	9%
Zeger	-	-	-	100%
Extra unit	98%	-	-	2%

PART V: FINDINGS & CONCLUSIONS

Sub Topics:

5.1. Introduction

5.2. Research Questions

5.3. Equivalent Statements of the Research Questions

5.4. Findings

5.5. Evaluations and Conclusions

5.1. Introduction

This section of the paper focusses on major findings of the study in three components, which are settlement, compound and house unit; findings of each cases are summed up to synthesize concrete statements to answer the research questions. In order to simplify and create flow of findings, research questions are converted to equivalent statements and used as subtopics having comparable meaning and intention with the questions. After giving answers to research questions the chapter ends with conclusions on the study.

5.2. Research Questions

- What is the *Gurage* vernacular house, compound and settlement in terms of Physical and spatial aspects?
 - o What are the procedures, rules or traditions and reasons behind, forming a village, parceling plots for each household and building housing units?
- What are the effects of the vernacular house units and village settlement of the *Gurage* on day to day life of households?
 - o What lacks the vernacular house units and village settlements to satisfy needs of the dwellers in terms of physical and spatial aspects?
- What are the construction processes, techniques and materials being used to build the vernacular house units of *Gurage* and in what condition are the availability of 'skilled' labors and construction materials?
- Is there transformation on the vernacular house, compound and village settlements of *Gurage* in terms of physical and spatial aspects?
 - o What are the factors of transformation?
 - o Which components are being transformed?
 - o What type of transformation is occurring?
 - o Who are the actors in the transformation?
 - o Is the transformation appropriate to its context?

5.3. Equivalent Statements of the Research Questions

- **Physical and spatial aspect** of the *Gurage* vernacular house, compound and settlement.
 - o **Trends of forming** a village, parceling plots and building house units
 - o **Merits and demerits** of vernacular house, compound and settlement
 - o **Construction** process, technique, usage of material and availability of local skilled labor and local materials.
- **Transformation and Transforming components** of the vernacular house, compound and village settlement

- o **Factors and actors** of the transformation
- o **Types and appropriateness** of the transformation

The above statements are discussed explicitly in settlement, compound and house unit level in the following sub-topic.

5.4. Findings

5.4.1. Findings in Settlements

5.4.1.1 Physical and spatial aspects of settlement

a. Physical aspects

The linearly stretched long traditional avenue which is locally named as '*jefwere*' is typical character in the *Gurage* village settlements. In the middle of which huge wide branched trees, like *Zigba* trees, are placed, though recently the traditional avenues are being invaded by built structures of communal services and infrastructures. To the right and left side of the traditional avenue grown *Enset* plantations attracts visual attentions dominantly; which is followed by thoughtfully proportioned and crafted traditional house units. There are also rectangular house units both with thatch and C.I.S. roofing clustered around the semi-public compounds in scattered way. Various plantations like, *enset*, chat, vegetables, thatch, bamboo, eucalyptus and pine trees etc., in the backyard creates a range of texture making natural pattern. While moving across backyards of a household to reach to the next village settlement, it gives a visual understanding of topographic character; which, as seen in most cases, is a folded land form with its up and down character, creating ridge at the top and valley at the bottom.



Figure 5.01

Pictorial description of physical aspects of settlement.

b. Spatial aspects

With in the expressed physical aspects of *Gurage* settlements there exist spaces in a range of public, semi-public, semi-private and private as it is entered from the traditional avenue to the compound, to house units and individual spaces respectively. The public space '*jefwere*' serves the community as a multi-purpose space such as, meeting and socializing, playing, transition for herding, traditional court processing, mourning and wedding ceremony and most importantly traveling space from village to village throughout the *gurarge* land.



Figure 5.02 Pictorial description of spatial aspects of settlement with activities.

c. Trends of formation

Settlements are formed through traveling in search for farm land and/or civil war for land grabbing, as in the case of *Arekit*, which let the existence of today's village or as they call it '*qaya*'. In the case where they search for farm land, as told by elders, they travel in group of five to ten in looking for an empty or forested land to settle on, where there is no other settlement. And if they got one it will give them a green light to decide in establishing a new settlement. After they decide to settle on that land they locate positions of major elements in the settlement like position of *jefwere* which is the avenue of the village and other elements like positions of grazing land. While deciding this important positions, they consider nature of the topography, where, they carefully put the *jefwere* on top level of the ridge; which guides other elements like the clustering of compounds and house units of each house hold and others.

They have a traditional measuring tool to divide and share their plots, which is called '*entar*' a double of which is '*shzir*' and twelve '*shzir*' is one '*wedero*' which is estimated to be 72 meter or 84 meter depending on the clan, where some consider one '*entar*' to be equal with the length of six or seven stretched fore arm of a man. Once the first group of settlers conquers the land and share it equally using their traditional way then, they will start to bring their relatives and close friends for whom they are willing to share their land. This process could also be done through parents, to settle their children and the coming generations. But in the case of civil war, the process is different; the land to be fought for had existing settlers of another clan which are not closely related with the invading clan. If men of the other clan feel like their population is

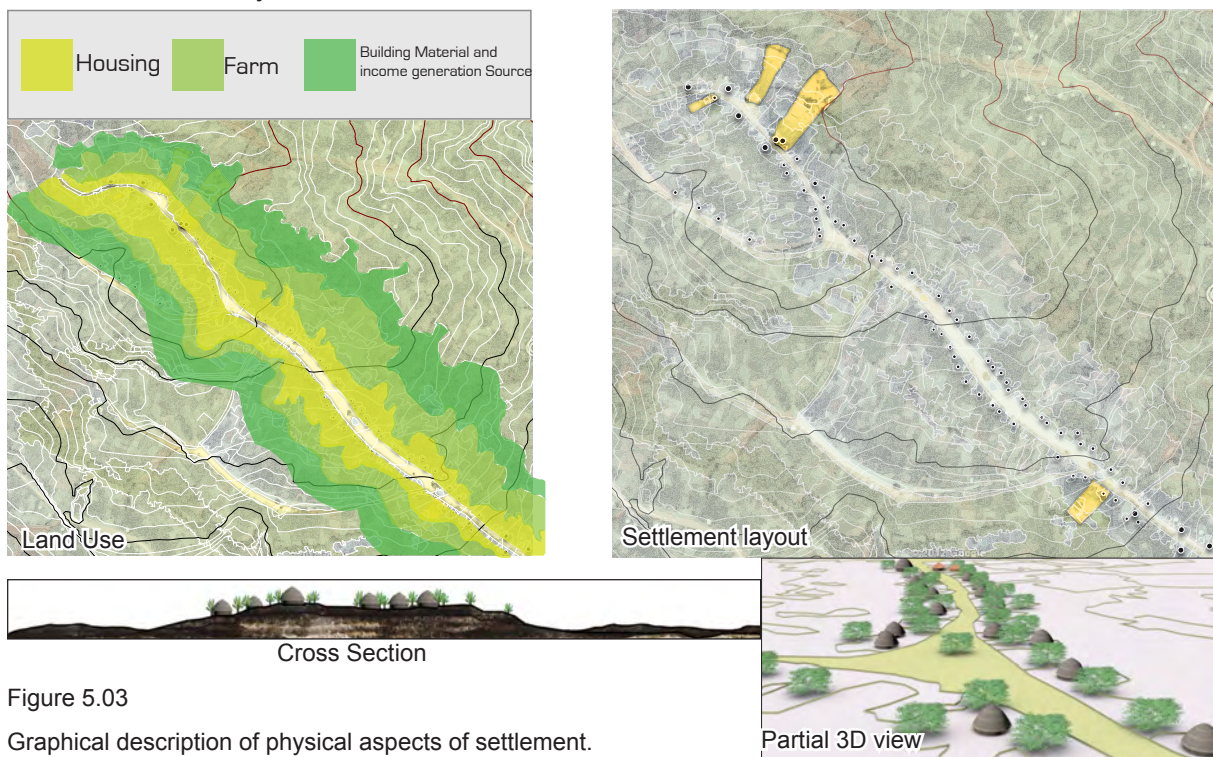
exceeding limit of the capacity of their land to hold, where they survived, and projected that it wouldn't be sufficient for the future of their next generation, most importantly if they make sure that they have enough power to win and conquer others' land they will go and fight for it and let others got away or be killed while fighting.

d. Morphology and organization

The organic linear morphology of the settlement completely blend within the natural landscape of the location as it is seen in all cases. The housing units are placed at the top ridge level of the topography forming a linearly organized compounds throughout the traditional avenue. And it also includes clustered house units within compounds of households in both left and right sides of the *jefwere*. Sometimes in case of a very long *jefweres*, based on suitability of the topography, pattern of the traditional avenue alters in branching out from its linearity following the topographic nature to allow a branching settlement as shown in figure 5.03.

e. Land use

In most settlements, of the cases, residential zone with its semi-public compound open space and plantations like *enset*, *vegetables*, *chat* and others, placed in between compounds, took the front line to the *jefwere*. And then the farming zone follows next to residential zone mainly towards the back yard and some times to the left and right side of the front yard, in a way, defining the boundary of the compound. Within the farming zone both food and income generating farm activities undertaken , as it is seen in all cases, which is followed by construction material sources, like eucalyptus, pine, bamboo, thatch and others which are for sale or/and for self-use; depending on the location. And in case of some settlements there are plots of mass grazing within the settlement; this is also true to happen to be used out of the settlements' territory.



5.4.1.2 Transformation and Transforming components of settlements

a. Transformation of settlements

Settlements are under transformation in such a way that, as it is seen in most cases, 'modern' service and infrastructures are being introduced like, gravel road, schools, electricity, communal clean ground water pumpers '*bono*', health posts, '*kebele*' offices etc. in the middle of '*jefwere*', which mainly affect the nature and purpose of *jefwere*. In addition to these, componential changes are being undertaken on both compound and house unit level as discussed below on respective titles.

It is found out that the younger generation of the *gurage* is migrating to urban areas in one or other causes, but as elders explained, the major cause is scarcity of land to survive on, many households are at the minimum share of land size which can only let them survive and they don't have extra land to transfer to their coming generation in respect with their tradition. And that is why the youth are migrating to towns and urban centers to find their own way to survive and help their family; in addition to other socioeconomic factors.

b. Transforming components

As it is stated above, main transforming components caused by the introduction of new elements which are intervening into the settlement like modern infrastructures and services. *Jefwere* is the main victim in the process of introducing new elements to settlements, in such a way that, using the advantage of its wideness all actors intervene through implementing their projects on it. And simultaneously, it becomes a cause for some components which are linked with the new element to transform, like the introduction of road brought fences to their front yard which is changing the semi-public open space of their compound to a more semi-private one.

c. Factors and actors

Major factors for such changes in the settlement are, needs for the introduction of important modern services and infrastructures like transportation (road), education, health, electricity and communal clean water provisions. These are results of interventions mainly led by government, community and N.G.Os with respect to demands of the people.

d. Type and Appropriateness of transformation

Generating causes of the transformation can be categorized as external and Internal which in this paper termed as 'exo-generic' meaning externally generated transformations and 'endo-generic' meaning internally generated transformation by the localities. And its appropriateness is measured in terms of criticality of factors and contextuality of solutions.

It is found out that some elements of the interventions are important for the development and wellness of the society. The argument here is that, the way they intervene in spatial and physical aspects of traditional settlements has less thought before implementation, neither

traditionally nor in modern settlement planning. Which can clearly be seen on the governmental and N.G.O projects implemented in the middle of the traditional avenues; as shown on figure 5.01.

5.4.2. Findings in Compounds

5.4.2.1. Physical and spatial aspects of compound

The *gurage* compound can be said 'self-sufficient' where it contains basic elements to let a family survive. It is composed of housing units for shelter where, in front of it is an open space for domestic activities and socializing and a back yard where they produce various farm products, from which they generate food stuffs, mainly *enset*, income generating products, construction materials and sometimes medicinal plants including *enset* types specifically for medicinal purpose. The compound starts from the traditional avenue or *Jefwere* having variable front size, based on its history; and it stretches to the backyard till it terminates naturally by small river, a sort of forest or valley of the natural topography.

a. Trends of forming a compound

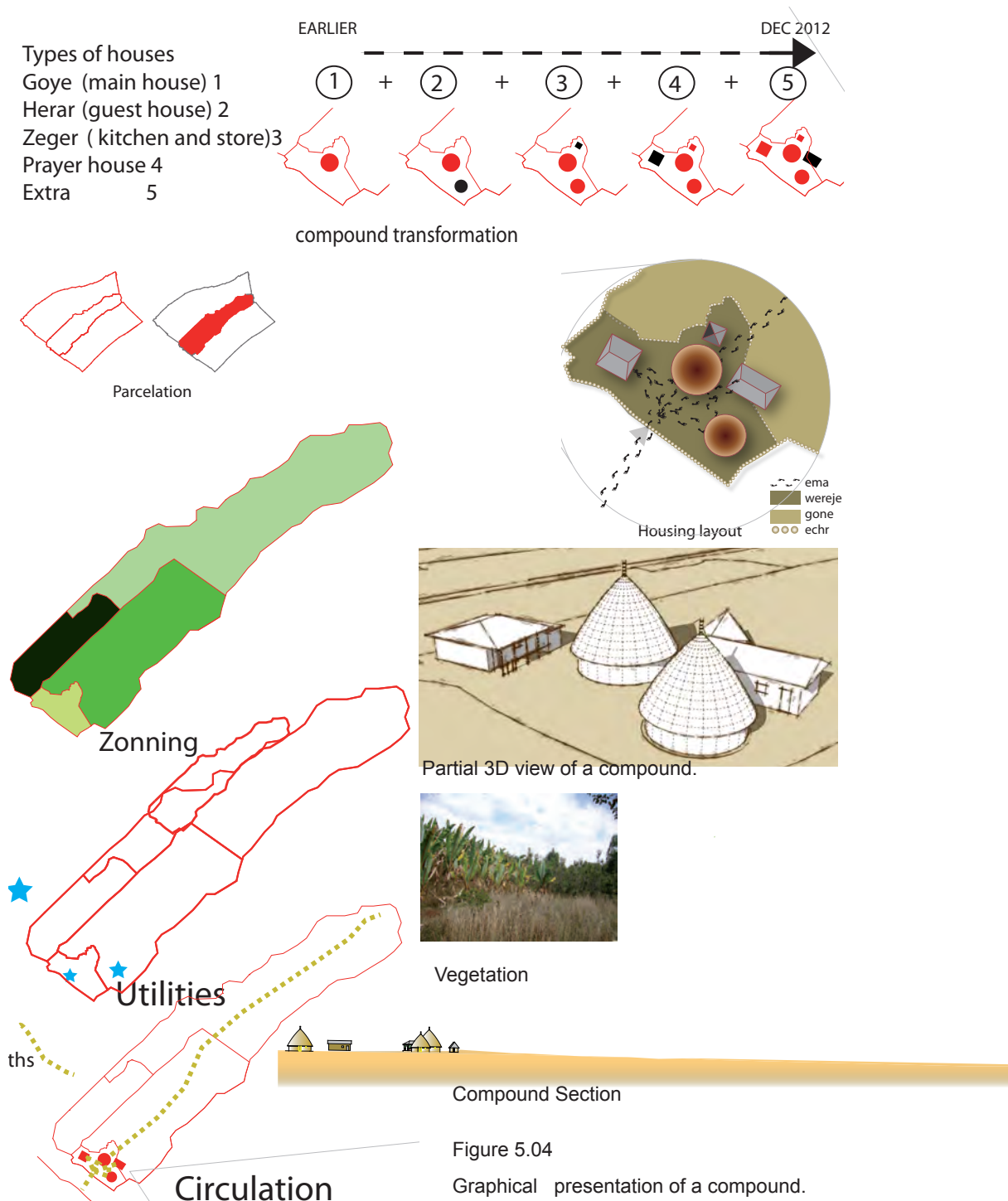
Formation of the *gurage* compound is highly linked with the capacity of the first generation of a family who started the settlement where they are responsible for the preparation of house and land for their coming generations by sharing their own, or holding another one through purchasing or in some other ways. They use traditional measurement system to divide and share their land which is done by a local authorized person called 'e'*shzir dane*' in which 'shzir' means twice of a measuring stick called 'entar' whose length is six stretched forearm long, so one 'shzir' is equivalent to twelve forearm long which they consider it as six meter; which is also checked on site by measuring the stick. And the next bigger traditional measurement is 'wedero' which is twelve 'shzir' around seventy two meter. And whenever they state their compound size they tell 'x- wedero', where x is the size in number, by considering the front size only, as described in all cases. So they pass or share their land by using this traditional measurement system, as stated above, for their coming generations.

b. Merits and demerits of compounds

The self-sufficiency of a compound is a potential concept seen in their compound layout, though it is not efficiently used as if it had been used in its full potential. And in some cases it is observed that elder and women headed households faces difficulty in fully utilizing their compound, specially the backyard where farm activities occur, having shortage of labor and alternative farming mechanisms in their location. Lack of excess, cash crop, production from their compound to the market led them in leading similar lifestyle, for long period of time, as their former generation. There is also lack of knowledge how to use smaller sized plot of land for multiple range of production for domestic use as well as for market.

c. Construction

House units are the first components to be built at the beginning of compound formation, next to sharing and marking plot of the owners. Through time and process the compound changes its morphology having the number of house units increased and other elements. Emergence of fence created construction of a compound border in order to define and segregate their territory for a reason of security and protection. And sometime as seen in some cases the digging of ground hole to extract ground water for domestic usage is also observed. In addition to these elements utilities like shaded latrine pit, electric lines and solar panels are also seen, having given positions in compounds.



5.4.2.2. Transformation and Transforming components of compound

a. Transformation of compound

Transformation of compounds seen mainly in three elements as summarized from the study, which primarily includes fencing where owners explained that, there was no such kind of fencing element before long ago and they attach their explanation for the question why they started it with the introduction of new elements like road and other modern services. Which is the reason why they started to use fences in order to secure and protect their territory. The other element is size and morphology of the compound as the number of house unit increases and as the position of the re-built house unit changes, size and morphology of the front yard or housing compound changes as shown in figure 5.04. Introduction of shaded latrine pit in their back yard is also part of the transformation from their traditional setting. though the proportion is too small there are also solar panels and provision of electricity through wiring, for lighting and energy consumption, which took its place within the compound.

b. Transforming components

As stated above, introduction of fences, shaded latrine pit, increasing number and type of house units and changing morphology of the compound, introduction of solar panels for energy consumptions are components which are being added to transform the traditional setting.

c. Factors and actors

Needs of the people for the introduction of modern elements in relation to their purposes are major factors for the transformation, in addition to proximity of villages to rural towns, economic status of the house holds to afford modern elements and influence of family members living in urban areas. This might include road, electricity, piped and pumped water supply.

Government, the community and NGOs are the major actors for such changes. In connection with the introduction of some elements there comes issues like territorial definitions and security issues which let them use fencing for their compound and minimizes the direct spatial connection and flow from their *jefwere*. Relative and family members who live in towns also take their role in transferring new urban elements to rural.

d. Types and appropriateness of transformations

Though most of the changes in compounds are results of introduction of modern elements, it can be considered as a forwarding step because they are for the betterment of the population in terms of accessibility, energy consumption, appropriation etc. Though the major transformation of compounds are initiated by owners there are also external influences initiated by others so, both 'edo-generic' and 'exo-generic' transformations exist in the process.

5.4.3. Findings in House Units

5.4.3.1. Physical and Spatial aspects of house units

a. Physical aspects

As described by many authors the *Gurage* vernacular house is composed of conic (hyperbolic) and cylindrical volumes of the roof and wall respectively. The *Gurage* people have their own proportioning principles and thumb-rules to build their vernacular houses; such as: height of a house unit has same dimension with diameter of the circular layout of the floor. As shown on figure 5.05. the major diagonal struts radiate at one third of the height of central post from the ground and the minor or smaller struts radiate at one third of the remaining height above the main strut from the top. Length of the main strut is the span between radiating points of the two struts. Height of the wall respects height of the central post where the main struts radiate from. These traditional proportioning principles, techniques and thumb-rules create the elegant composition of the two volumes. It is also important to note that this principles are applicable for all the three types of the *Gurage* vernacular house units. These days rectangular units also coexist with them, which has no relationship with the traditional ones in terms of proportion, form or composition; they are just copied pieces of the urban fabric.

b. Spatial aspects

As it is stated in the compound description, in most cases there are multiple house units per household with in a compound which are given various purposes. As shown in the analysis and findings most households have two units of the main house unit and the guest house unit. The basic house unit in the *gurage* compound is the main unit which is called *goye*, and it serves multipurpose and contains all activities, in case where there are no other house units, which includes the socializing space, sleeping space, cooking space and the cattle space as major function. In cases where there are two units it is either *goye* and *herar* or *goye* and *zeger* and in some other cases there is a possibility to have all the three house units whenever the owner is in a good economic condition. *Herar* is said to serve as a guest house in the traditional functional organization, but based on the study it also serve as a children unit, storage of selected goods and sometimes it also used as a backup space for *goye* whenever *goye* becomes insufficient for some functions like cattle space and others. *Zeger* is usually used as a kitchen and also a storage of cooking related items.

c. Trends of building a house unit

As the analysis shows in most cases the first house unit is usually built by a father to son to be used as main unit or sometimes *herar* is given to son till he manage to build his own house. After which the son will acquire more units as the spatial need increases. The next unit might be the guest house (*herar*) or the kitchen and store (*zeger*), but based on this research most of the compounds contain *Goye* and *Herar* which are the main house and the guest house unit, while using the *goye*, in addition to its main purpose, as *zeger*.

d. Merits and demerits

Merits

Context: The *Gurage* vernacular house units are contextual in such a way that it respects availability of local materials, local skills and technique, its climate, location and needs of its users. But currently it is facing challenges of the time. For some owners the vernacular houses are being defeated by this era where the competition and alternatives are increasing. And some owners admitted that, as soon as they manage to afford alternatives they will build the rectangular units with modern materials. There are also owners who Oppose this idea in such away that, they want to keep the vernacular units by only altering some elements with modern materials.

Comfort: In most cases owners prefer the vernacular units for their comfort both for cold and hot seasons. As they explain during hot seasons it keeps the spaces cooler and during cold seasons it keeps the spaces warmer by preserving the heat absorbed during the day time or the heat created from within. And in addition to that, as they explained, it is flexible to start fire and generate heat having the smoke ventilated through voids of the thatch roofing without suffocating them; which is not possible in the rectangular unit.

Flexibility of Spaces: In the vernacular units spaces are delegated for multi-purpose depending on time shift. For example, both '*kaket*' serves various purposes; the main '*kaket*' is for sleeping space of parents during night time and socializing space during day time and the other '*kaket*' is sleeping space for children during night time and socializing and dinning space during day time. And in the cattle space they create a vertical layer of space called '*kote*' for storage purpose.

Sustainability: It is unquestionable that vernacular built structures are in the most sustainable form, so are the *Gurage* vernacular house units in terms of using local materials, construction technique, labor, skills, function and respect of its culture.

Material: They use local materials for the construction of their house units which can be termed 'as local as from their own compound' whenever the available materials are matured enough to be used. When they build the vernacular units all pieces of materials are 'green' where there is no usage of energy for their production.

Technique and Skill: The *Gurages* are known in having a well developed construction technique to build their houses. They have local experts within the community who build the vernacular units for the community using locally developed skills which was transferred from past generations.

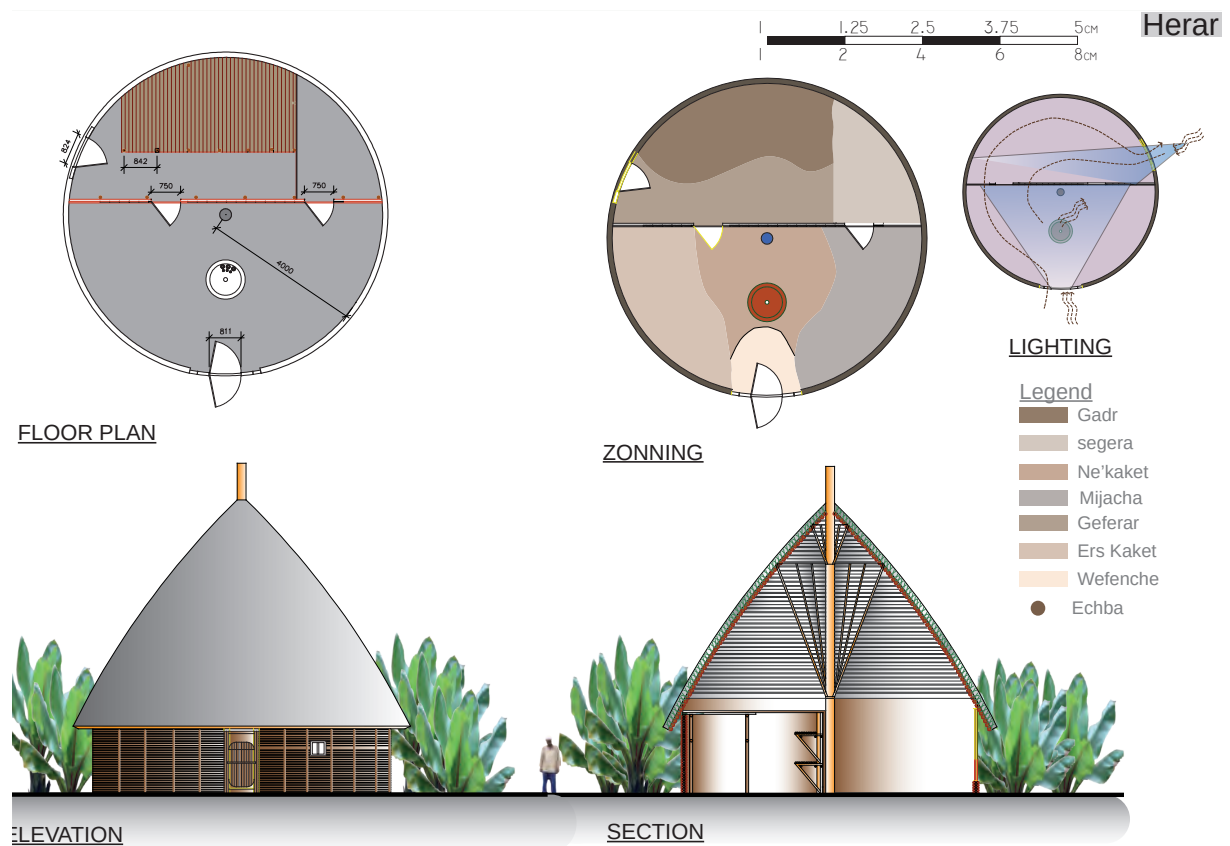
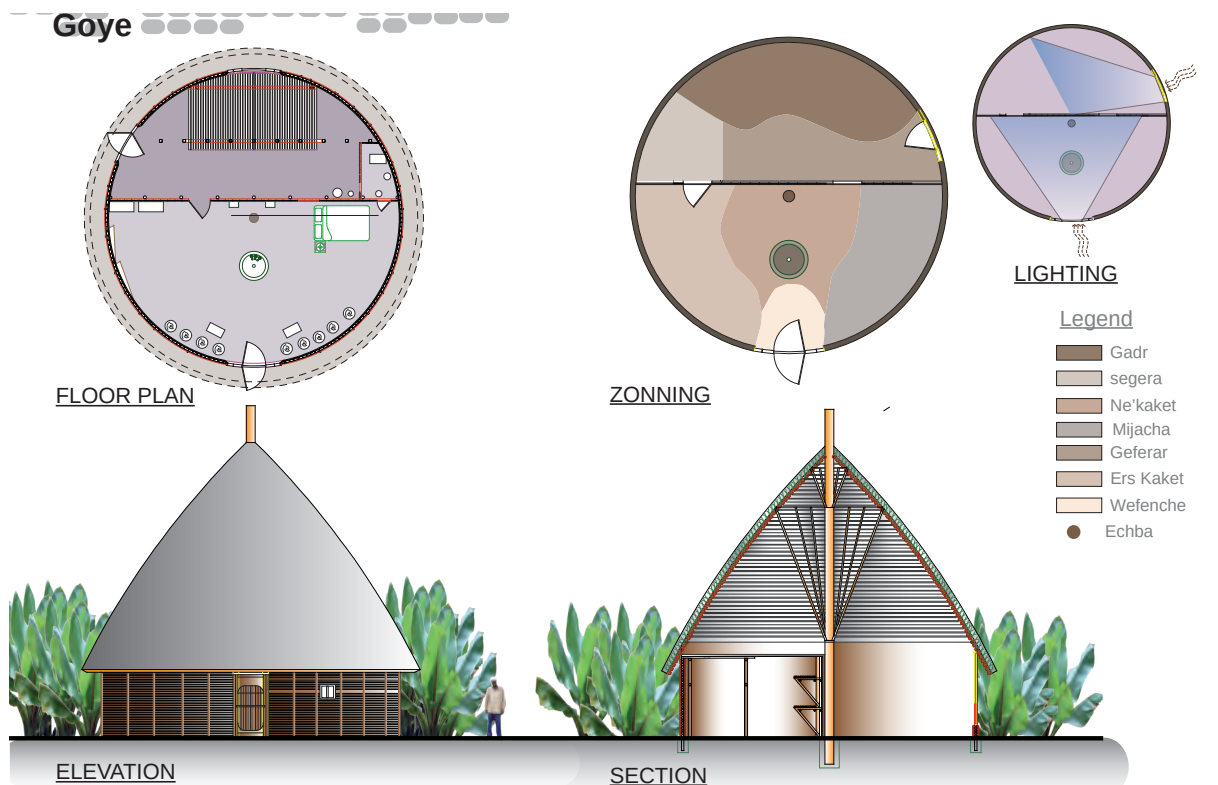


Figure 5.05
Graphical presentation of house units.



Figure 5.05.a.
Graphical presentation of house units.

Labor: During construction the community set rules, which becomes tradition, to give hand in helping each other whenever needed. So, whenever someone is about to construct a house unit it is the community who help the owner, as laborers, to build the house with the guidance of the local expert.

Demerits

Weakness of Materials: The materials used to build the vernacular houses are weak in such a way that, they can't resist fire, less durable, easily damageable by moisture and termites and they are not weather resistant. Because of this they fail to compete with modern

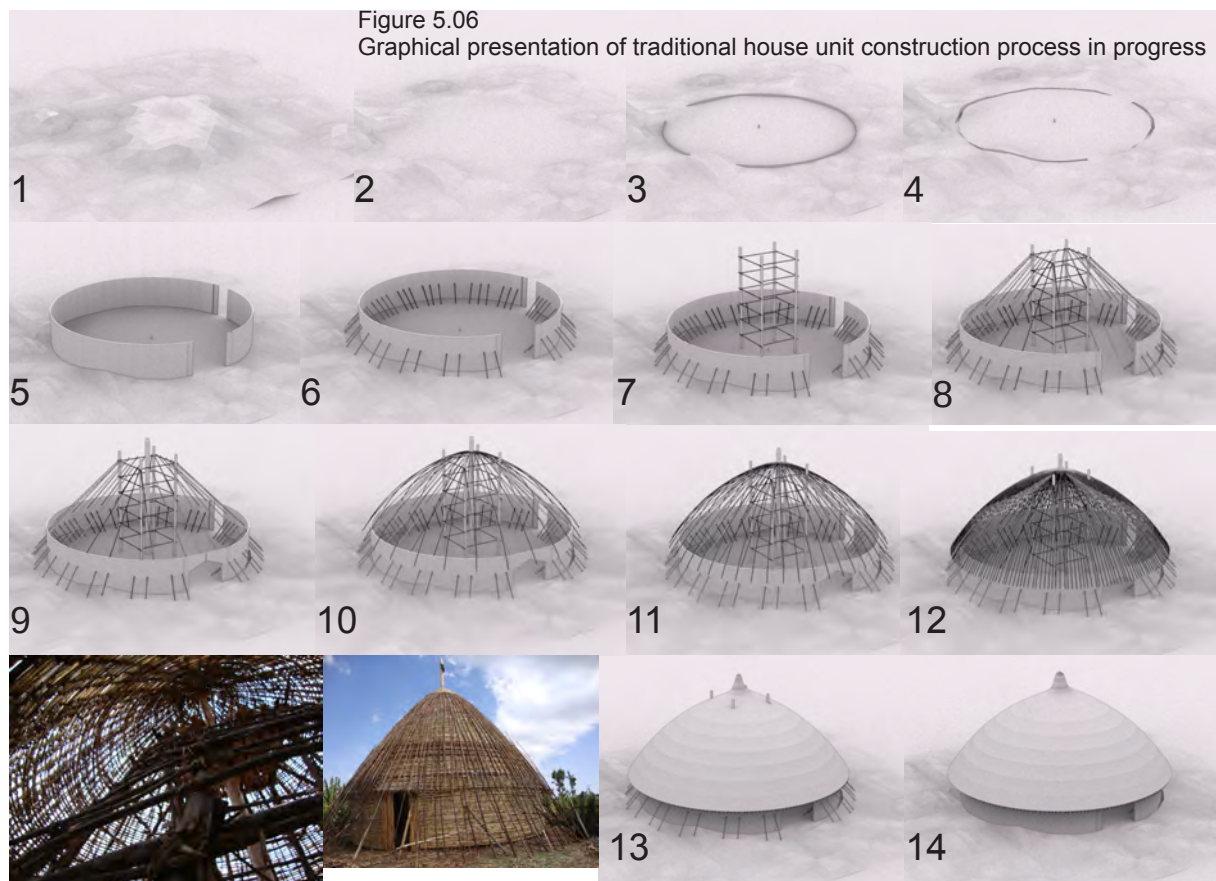
materials.

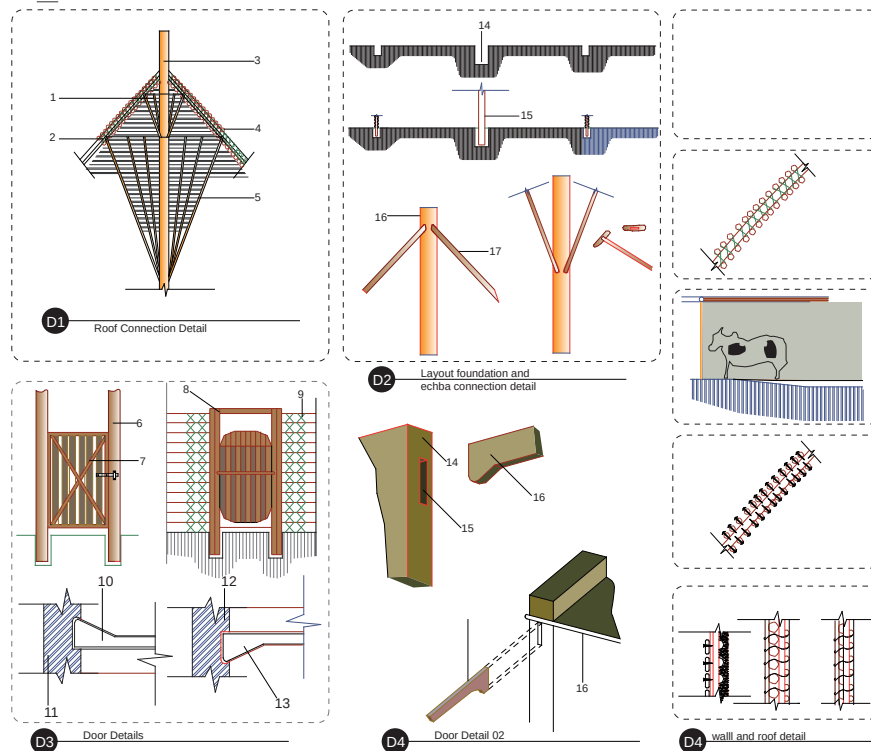
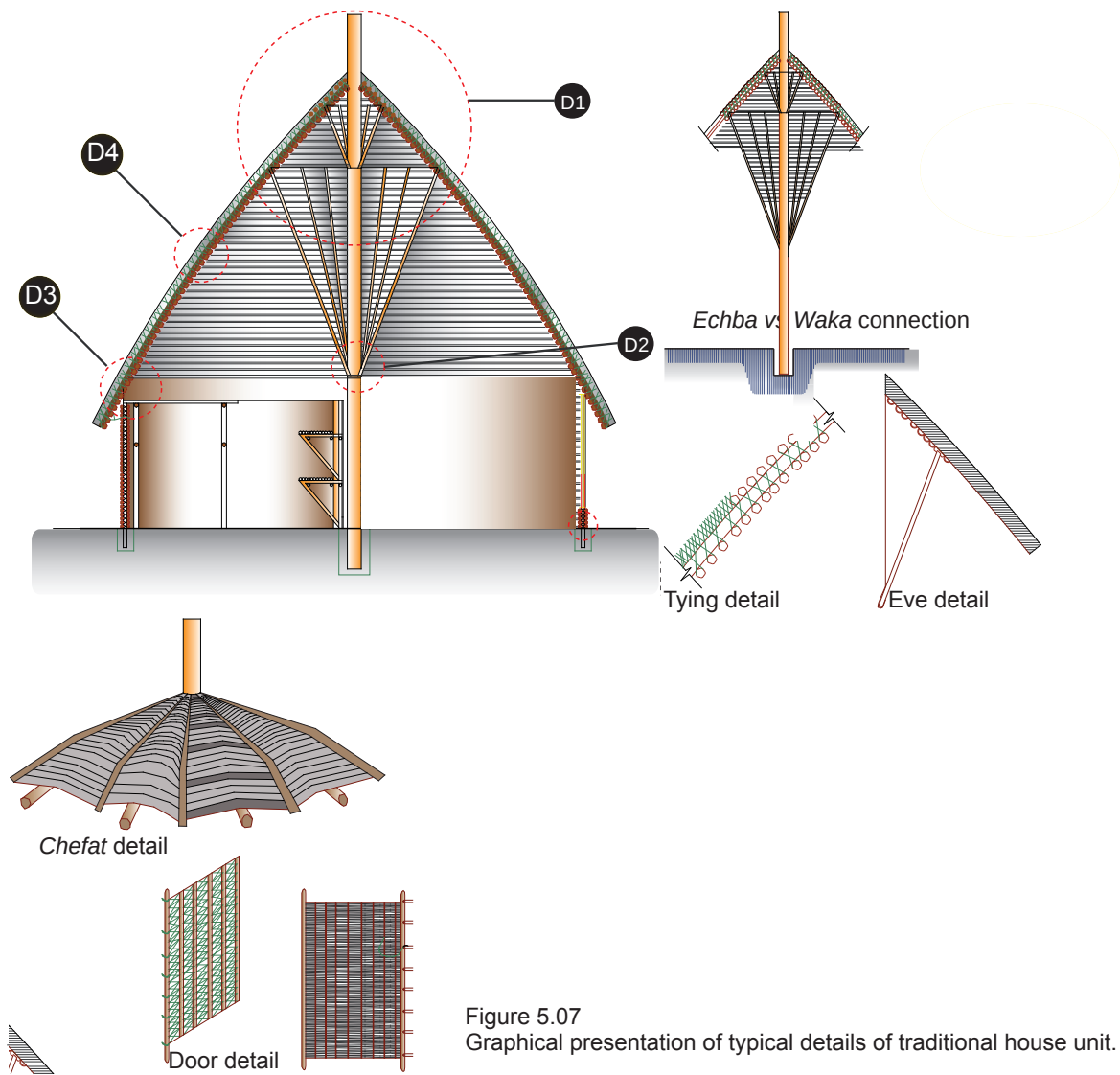
Human space vs Animal space: Some owners manage to segregate the socializing and sleeping space from animal intervention in partial way. But still share their territory with animals partially for some activities like cooking and storage spaces. There are also some owners who live with in old style spatial layout, sharing sleeping and socializing spaces with their animals; which might expose them for some health problems.

Void vs Solid Surface Proportion: Majority of the vertical surface area proportion is solid in the vernacular house of *Gurage*, except two doors with dimension of 2.10m x 0.85m and three windows with 0.60m x 0.60m of size, both at maximum dimension and quantity, there is no void surface on the entire area of the *Gurage* house. This in turn has a direct impact on ventilation and lighting of the space naturally. In addition to this, usually , they don't use windows both for ventilation and lighting, rather they keep their doors open with the traditional half door called 'giye kerkir'. This again might have its impact on the health of visual and breathing system of the inhabitants.

Vertical Space: The *Gurage* vernacular houses have, based on this study, a maximum of 12m internal height. Though they manage to build a structure with a height of four storey as in a typical modern building, they never use the vertical space except for '*kote*' which is used as a storage and for drying fire woods. So the inhabitants fails to use its potential in appropriate and efficient manner.

e. Construction





5.4.3.2. Transformation and Transforming elements of house units

a. Transformation of house units

The open layout of the *gurage* houses are being transformed in their internal space through various influences in such a way that, the segregation of cattle and human space. In addition to this depending on the income status of the household head some functions might get built a separate unit like the guest house and kitchen/storage unit. In earlier times both main and other units were made in local materials and local builders, but recently as it is seen in most cases the contextuality of additional units are being varied from the past. As it is seen in the analysis most *herar* units have rectangular layout and corrugated iron sheet roofing material connected with nail. And *zeger* is also changing its layout in to square and usage of nails for wall connection is observed from the study.

b. Transforming components

Material: as it is observed in most cases materials of roofing, ceiling, connection, wall finish, floor finish are changing to imported elements like corrugated iron sheet, nail, rubber, paint, pvc respectively. This does not mean that it is seen in all types of house units but the *herar* unit took major portion of the change and also some *Goye* and *Zeger* are in process of transforming their materials as stated above.

Form: there observed a unit having rectangular volume with a pitched roofing with ridges and valley, made with corrugated iron sheet. In most cases they use it as a replacement for *herar*, *zeger*, extra unit or sometime even for *goye* but the quantitative proportion can be considered from high to low in respective sequence.

Layout: transformation of layouts can be seen in two ways. One: partial layout transformation whenever it happens within the vernacular house itself and two: a complete layout transformation whenever it is changed into rectangular unit.

Partial layout transformation: in this transformation those layouts which changes positions and characters of their internal space defining elements or partitions keeping the exterior wall layout as it is, are included. This kind of transformation occur when owners try to segregate human and animal spaces by changing position of cattle space towards the rare side of the house by adding a separate access for the cattle and making partition wall behind the central post.

Complete layout transformation: in this transformation type the original layout which is the circular one changes its form completely into rectangular type, after which it will be given same purpose as the vernacular one in different pattern. This kind of transformation happen whenever the owner is highly affected by urban influences and / or by challenges and difficulties to build the vernacular house.

Construction technique: as the usage of local construction material is changing the method or technique of construction also changes and it is observed in all units where they use

non local (imported) material.

c. Factors and actors

Population growth: as elders of the dwellers acknowledged there is a population growth in their land where they have been and they are facing in scarcity of land for their coming generation. It also cause maximization of farm land instead of reservation of construction material specially thatch which is one of the reasons in replacement of roofing material. As the dwellers complained the government is pushing them in maximization of food productivity through full utilization of their land for food production. This causes in loss of reserved land not only for construction material but also for grazing.

Land scarcity: caused by population growth and uniform way of life style through out number of generations in a given location.

Thatch scarcity: caused by loss of reserved land for construction material and the pressure from government in letting the inhabitants fully utilize their land for food production.

Increasing in material cost: caused by scarcity of construction materials.

Type of thatch: In some cases they have started to use the straw of sorghum and /or wheat, which is a by-product after harvesting, in replacement of thatch. But as they said it won't stay longer than two years, whereas, the thatch which grows on original land (a land which is not been used for farm) stays 10 to 12 years even in some cases 15 years, so it is causing increasing frequency of maintenance period. This again leads to prefer other solutions which can avoid this problem.

Frequent maintenance: the repetitive frequency of maintenance, which is caused by weakness of materials used for construction to resist weathering, moisture and termite actions; invites the localities towards looking for better alternative solutions to overcome the above challenges.

Complication of roof making: their traditional way of roof making is ,as explained in the construction process, complicated and it is the stage where a lot of labor needed, which in current situation is getting challenging, and this effect let them to look for simple and easier options or alternative construction techniques.

Migration of the young generation: causes in loss of the working group in the society which is strongly dependent in social works especially in activities of construction and farming process.

Availability of minimum 'better' options: there are no multiple options which can help them in solving their challenges and substitute the complications. So they simply opt for the available solutions without evaluating its appropriateness.

d. Types of Transformation

Both Endo-generic and Exo-generic transformations are observed in the study. Most of the exo-generic transformations are led by substitutions of local material with imported ones. Substituting the scarce materials is not a simple task for the majority of the population who lives in the rural areas. In most cases those who afford to substitute the scarce materials are those who have multiple income generating mechanisms or income sources like, children supports, those who live in town or they should participate in multiple income generating activities or they should become hard working and outstanding farmers. These facts imply the type of transformation from where it is initiated. There are also some cases where children living in urban areas, fully, took responsibility for the construction of rectangular unit with CIS roof covering material, which makes the transformation type exo-generic.

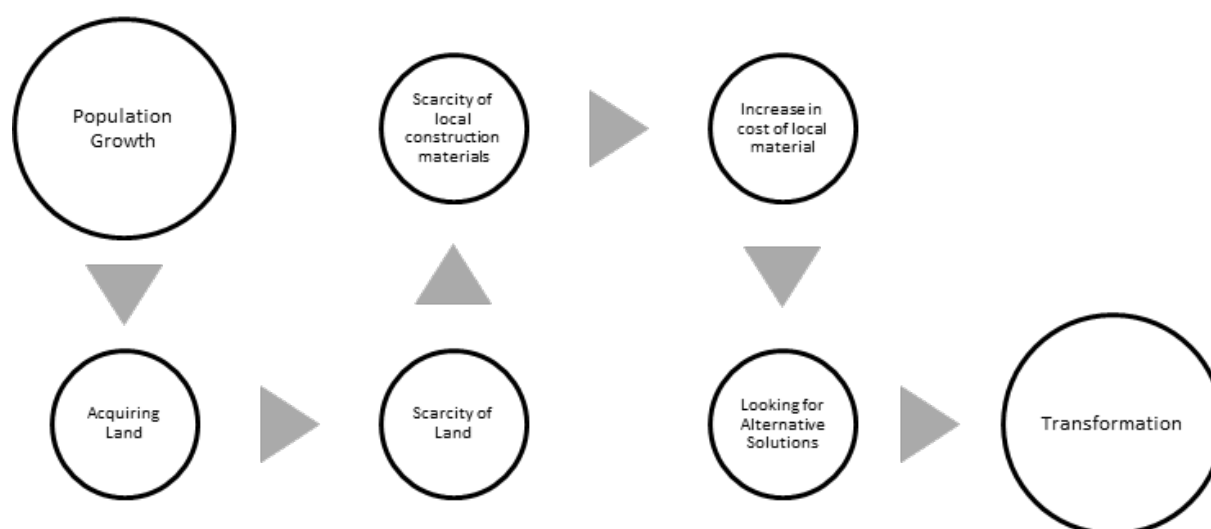


Figure 5.08
Cause Effect Diagram

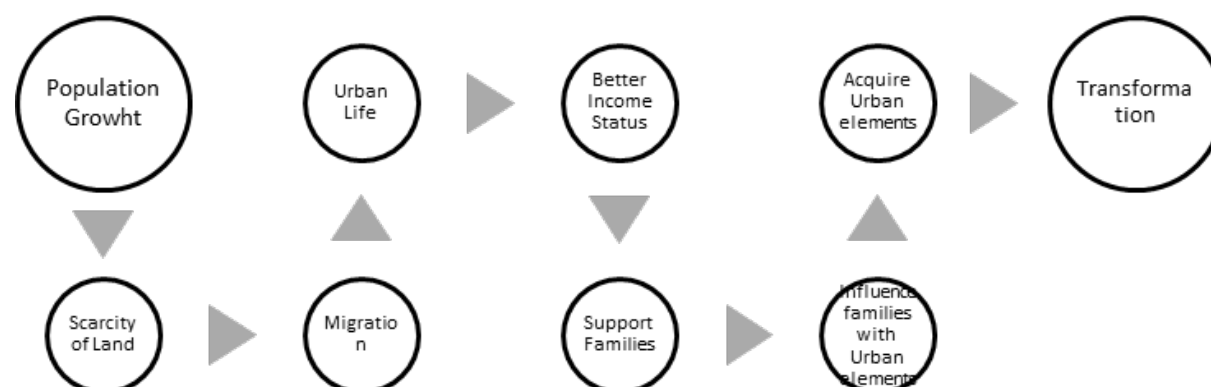


Figure 5.08 b
Cause Effect Diagram

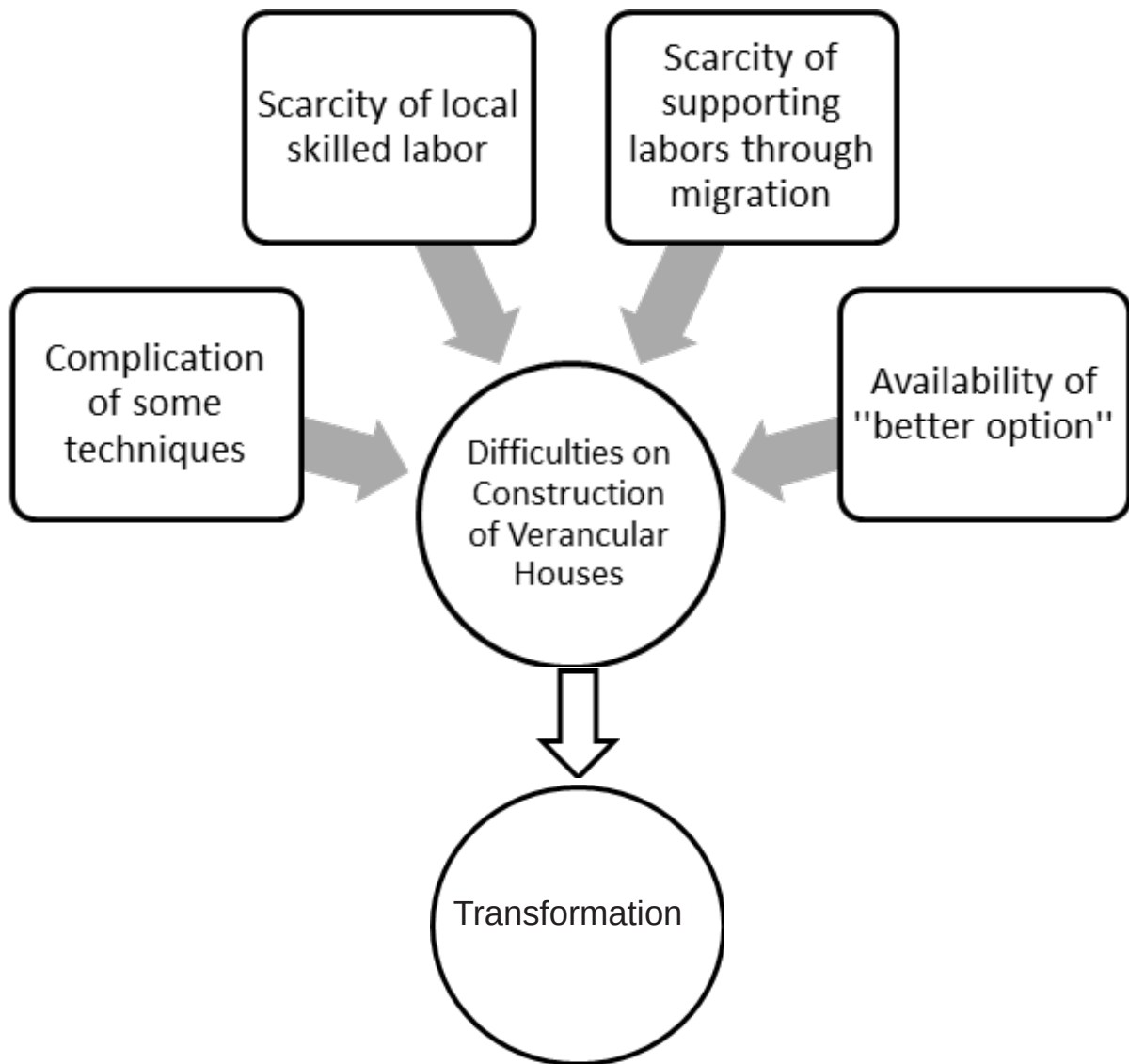


Figure 5.08.b.
Cause Effect Diagram

5.5. Evaluations and Conclusions

5.5.1. Criticality of the factors

The factors which pushes the traditional aspects of vernacular house, compound and settlement to transform are critical and naturally occurred. The basic essence or core of the factors is population growth and availability of limited resources. Which in this study the limited resource is land where they grow their house units, generate their food, fuel energy and generate income whenever they need currency. So if this resource reaches its limit to let the growing population survive then this factor must be critical which might lead to create optional solutions to overcome the challenge. In such situations the solutions can be seen in to two generalizations, one to maximize the limited resources in proportion with population growth or to minimize the population growth, which can keep the vernacular conditions as they are. And the second option is to go in line with the population growth and its outcomes leading towards creating possible ways of solving problems.

5.5.2. Contextuality of the solutions

Solutions used by the localities:

Migration: since it is clear for the localities there is a scarcity in land resource they prefer to migrate to a nearby town or major cities of the country as an option so that they can reshape their way of life in situations they may face.

Adaptation: those who live in rural areas solve their challenges in their built environment through adapting solutions given in urban areas, which is the next best preference they have. For example they adopt corrugated iron sheet for the challenge they face in scarcity of their roof covering local material, which is thatch. The other element is connecting material which is nail. They use nail to connect wall cladding and structural members in the vernacular units for the reduction of frequent maintenance period. We might say these adaptations are not contextual since they are not local materials and techniques, but, if we see it from the angle of available solution which are on the ground we might end up with the adaptation is OK! for those who can afford.

So it can be summarized that, multiple practical researches like SRDU, which is being done in considering same study area of this research are needed to provide options of solutions, in guiding its transformations, for their problems and challenges, so that, they can adapt details and solutions to their context instead of doing it with imported materials and techniques.

PART VI: RECOMMENDATION

Sub Topics:

6.1. Introduction

6.2. Recommendation

6.3. Conceptual Design Guiding principle

6.1. Introduction

Recommendations are dependent on and related with findings and conclusions of the study. It is tried to recommend on important issues which can let to incorporate and enhance positive aspects and, also to overcome and solve negative aspects, challenges and difficulties of the *Gurage* vernacular house, compound and settlement.

6.2. Recommendations

- As it was seen on findings, the root factor of the transformation is population growth which drives other factors to happen.
 - o Though there are 'health extension programs' working in rural areas teaching on related issues like birth control and family management , there still needs more stress on the issue by the concerned organs. This issue is a factor for various problems in creating multi-dimensional crisis; even for this particular study it becomes visible that the people are being challenged by scarcity of land which derive scarcity of local construction material which results in change of local construction system, also provokes migration which results in increasing urban population etc.
- Though the economic base which let the vernacular setting survive is farming most farmers on the study area fail to produce a surplus production (cash crops) effectively more than for own use.
 - o There must be a way by the concerned organs to teach the farmers, which are above 90% of the population of *Gurage* zone, how to produce surplus production which can make them generate income and sustain themselves and upgrade their life. For example : they can teach how to use their scarce land efficiently and effectively, what kind of crop production can make them productive and effective, what type of farming mechanisms should they use etc.
- The *Gurages* have a very strong social network and interactions in their day to day life. They accomplish challenges and problems of their social life by being together. But when it comes to agricultural productions for commercial purpose, individualized productions and decisions dominate.
 - o There are potentials in the social structure and network of the people of *Gurage*. Though this is the reality no concerned organ is seen to upgrade or use these potentials in modern social systems or even to try to modernize their traditional systems. For example: their social structure and network potentials can be upgraded and converted into communal cash crop production organs, where they can produce similar crops in their backyard forming a group in the entire villages. This kind of system might help in attracting demands from the market for that specific product in specific location which can call merchants to villages. This kind of mechanism might help farmers in upgrading their way of life through generating income at their front yard.

- It is found out that, though the physical and spatial elements are transforming, way of life of the people is still similar as they were farmers many centuries ago.
 - o If the above recommendations are implemented well, then, it might be important to consult the people to work and put their effort on becoming agro-industrial farmers and use mechanized way of farming. This can be realized through organizing farmers to co-work with investors who have potentials in the location. For example: let's say a group of farmers become producers and have potential to supply milk , so a responsible organ should attract investors to process and pack milk and milk products. This approach can also be replicated into other productions like: fruits, vegetables and other exportable and crops. This process might help in upgrading their way of life.
- The people of *Gurage* preserve materials, be it for new construction or maintenance, for self-use or communal and sales; but currently they are facing challenges on the issue because of government push in suggesting to fully utilize their land for food crop production only.
 - o Most of the studied areas preserve eucalyptus trees for their construction material demand. There are also pine trees both indigenous and non-indigenous , bamboo (the highland type) and others like thatch and tying materials. While preserving those materials they might see it from addressing their problems on construction material and generating income. But this trend might affect other issues in relation with soil and environment aspects. For example it is known that, eucalyptus trees highly consume water and for this reason it affects other plantations around it. So concerned organs must have detailed study on the issue and aware the people to use best alternative construction materials instead. Though the issue of increasing food crop production in the country is clear, the way of implementing it should take the advantage of construction material preservation in to consideration. As they grow construction materials it must be considered as they are also growing their houses naturally. Because they use no industry or man made energy for its production which makes it sustainable. Therefore while pushing them in food production the above aspect shall not be compromised if a sustainable rural housing is needed to be achieved.
- As found out physical and spatial transforming elements are adopted from the near by alternative solutions which they think solves their problem. But every transforming element might bring its consequence in the future in terms of energy consumption, sustainability, carbon emission etc.
 - All actors ,like, Governmental, Non-governmental, private and public organizations, involved in the transformation shall initiate and support on going and further researches on alternative appropriate materials and design solutions which respect the context

of Gurage and easily adoptable.

- Proto-types of the design solutions shall also be built at least in every *wereda* and climate conditions and iff possible in every *jefwere* so that the people can easily approach and adopt details which they believe it can solve their challenges. Through such approaches we can achieve guiding the transformation and enhancing the vernacular HCS of *Gurage*.

6.3. Conceptual Guiding Design Principle

The general concept shall focus on enhancing and developing the positive potential aspects of the vernacular house, compound and settlement of *Gurage* in addition to addressing challenges and negative aspects. In the design process it is also recommendable to incorporate and use best elements of specific purposes from other vernaculars of Ethiopia in initiating a cross pollination mechanism of details and elements for best outputs. Which must be incorporated and considered in line with the context of the Gurage vernacular house, compound and settlement.

Based on findings of the research, potentials and weaknesses of settlements, compounds and house units are listed below which shall be incorporated in design process

Settlement

Potentials

- Adaptation of topography through settlement layout
- Traditional road network
- Purpose and size of the traditional avenue or as they call it 'jefwere'
- Availability of plot division system in the traditional social structure

Weakness

- Monotony of its linearity
- Absence of appropriate infrastructure, services and utilities
- Absence of activities to attract people from other places into those wide traditional avenues
- Absence of communal centers to accommodate traditional gatherings
- Absence of guidelines how to intervene new elements to the settlement.

Compound

Potentials

- Self sufficiency
- Integrates living and working environments

Weaknesses

- Inefficiency
- Individualism

House Unit

Potentials

- Usage of local materials
- Flexibility of spaces
- Vertical height of the space
- Usage of local techniques and skills
- Proportions and thumb rules of their construction systems

Weaknesses

- Mix of imported or fabricated materials
- Mix of inappropriate spaces
- Darkness of spaces
- Less ventilated spaces
- Less-durable and less-fire resistant material usage
- Extra or unnecessary effort to accommodate other functions by building additional units

It is important to note that, the stated potentials and weaknesses are the most important issues to be considered in design process based on this specific research.

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Annex- A Case Studies

Case 1
Compound B
Owner Berga Nsrane

Number of houses 4
Front size of compound 87 m
Compound type 'private'



Compound: B

It is found in *Borkema* village settlement, which is located to the South Western direction of *Emdibir* town around 2km from the center of the town. *Ato Berga Nsrane*, the owner of this case, is 75 years old and he has four children, of which one is female all the children are married and started their life in *Addis Abeba* and *Welkite*. He has a fenced compound both at the external and internal part by using split wood of eucalyptus pole sharpened at the tip. As he remembered before the gravel road construction, which is located in front of his compound, there was no fence but the compound flows to the *jefwere* without interruption; but, after it was constructed they start to fence their compound, as he explained. In his compound he builds four house units, of which one is rectangular and covered with Corrugated Iron sheet serving as guest house as well as small business unit, one squared shape and covered with thatch roof for storage purpose and two of them are circular and covered with thatch roof which includes the *goye* and *zeger*. He divides the compound in to two having the a total front size of one and half *wedero* which is around 108m, one is the front yard which is located in front of the housing units and the other is the back yard which is used for different farming activities. The back yard is allocated for mainly *enset* and others like vegetables, fruits, *chat*, coffee, thatch, eucalyptus and others which are used for food consumption, fuel consumption, income generation, construction etc. He owns a ground water well serving as water source and he uses wood for fuel consumption and electric power for lighting during night time and operating his tape recorder and radio. He also incorporated in his back yard a latrine pit for toilet purpose.



Figure 4.06 Site Plan of Compound B
(Google Earth + Overlay)



Figure 4.06.a. Graphical Analysis of Compound B

Case 1
Compound C
Owner Shiwri Kerga

Number of houses 4
Front size of compound 107 m
Compound type 'private'



Compound: C

Its location is in a village called *Borkema* which is around 2km to the South West of *Emdibir* town. It is owned by *Ato Shiwri Kerga* who is 45 Years old, married and has three children living with him. And he got this land from his father who passed away 10 years ago. In his compound there are three house units of which one is rectangular and covered with corrugated Iron sheet serving as a guest house, the kitchen which has a squared layout having the wall and roof, covered with corrugated Iron sheet, and the other is Circular layout and covered with thatch roof serving as the main house unit. In his compound he cultivates items which are use full for domestic consumption, income generating and construction materials. Which are like Enset, cabbage, pepper, teff, coffee, chat, mango, Orange, lemon, thatch, eucalyptus, etc his compound is enclosed with fence and the jefwere in front of his compound is turned into main road which passes through *Emdibir* to *Arekit*. When he was a child he remembers that the compounds were open and there was no fence all over his village. He uses electricity for lighting and his tape recorder and radio, he also use wood as a fuel for cooking and generating heat. And he incorporated latrine pit in his back yard.

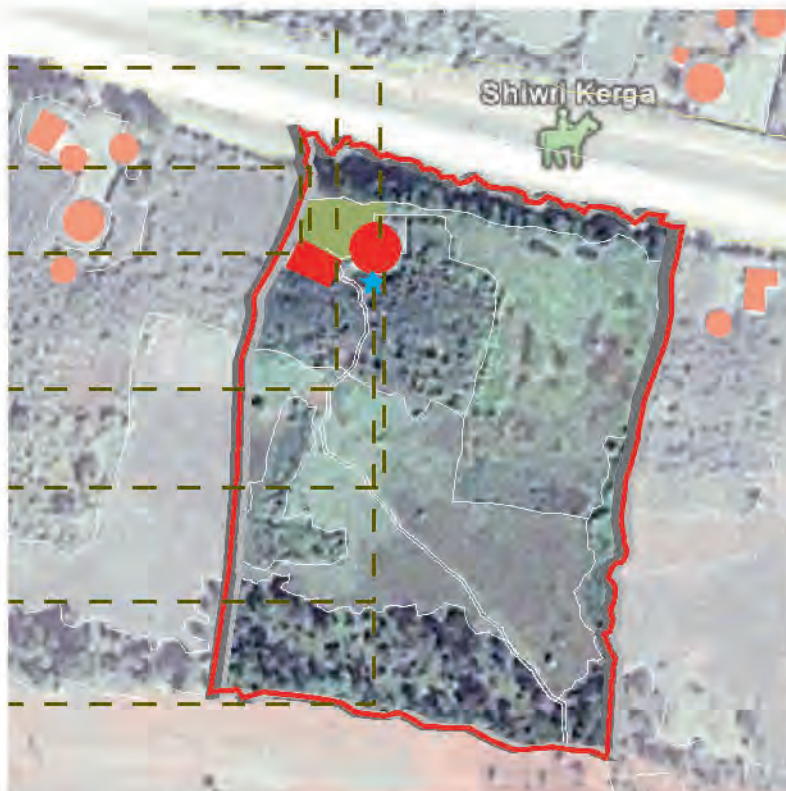


Figure 4.07 Site Plan of Compound C
(Google Earth + Overlay)

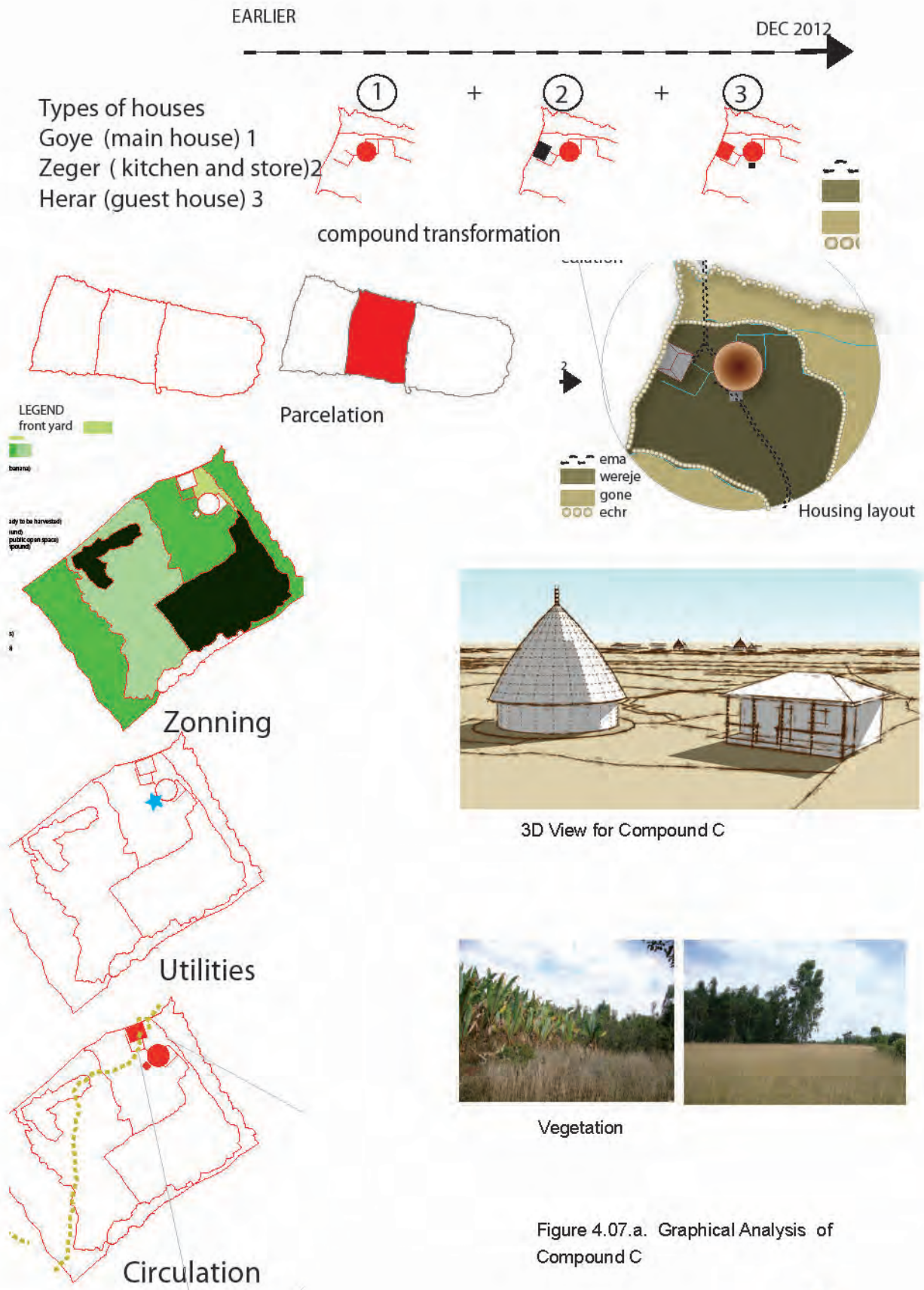


Figure 4.07.a. Graphical Analysis of Compound C



House Units: 2



Ato Berga Nsrane as described in compound 'B', He has four units which are the main house (*Goye*) in circular shape and thatch roof, the Guest House (*Herar*) in rectangular layout and covered with CIS roofing and trawl finished cement screed floor on hard core and used also as a small business unit in normal days, the (*Zeger*) is built in two units one serves only as a kitchen and the other used only as storage of goods, farm products and hay. The kitchen has circular shape and covered with thatch and the storage has square shape and covered with pyramidal roof structure and thatch. He generate income from his farm, through selling some products, and help from children in towns. He explained the difficulties of getting thatch and traditional builder makes the construction cost almost equivalent with '*korkoro bef*'.

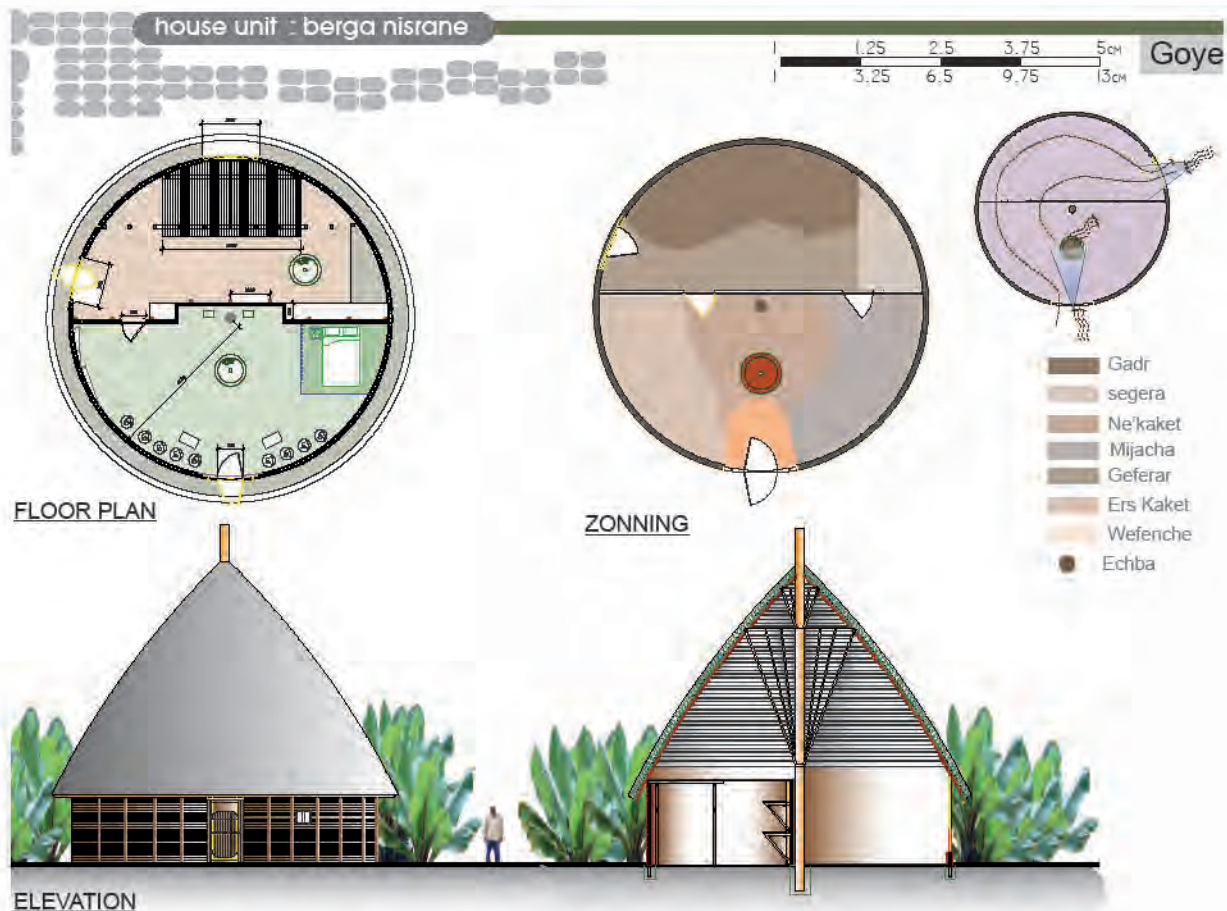


Figure 4.09

Graphical Analysis of House unit 2

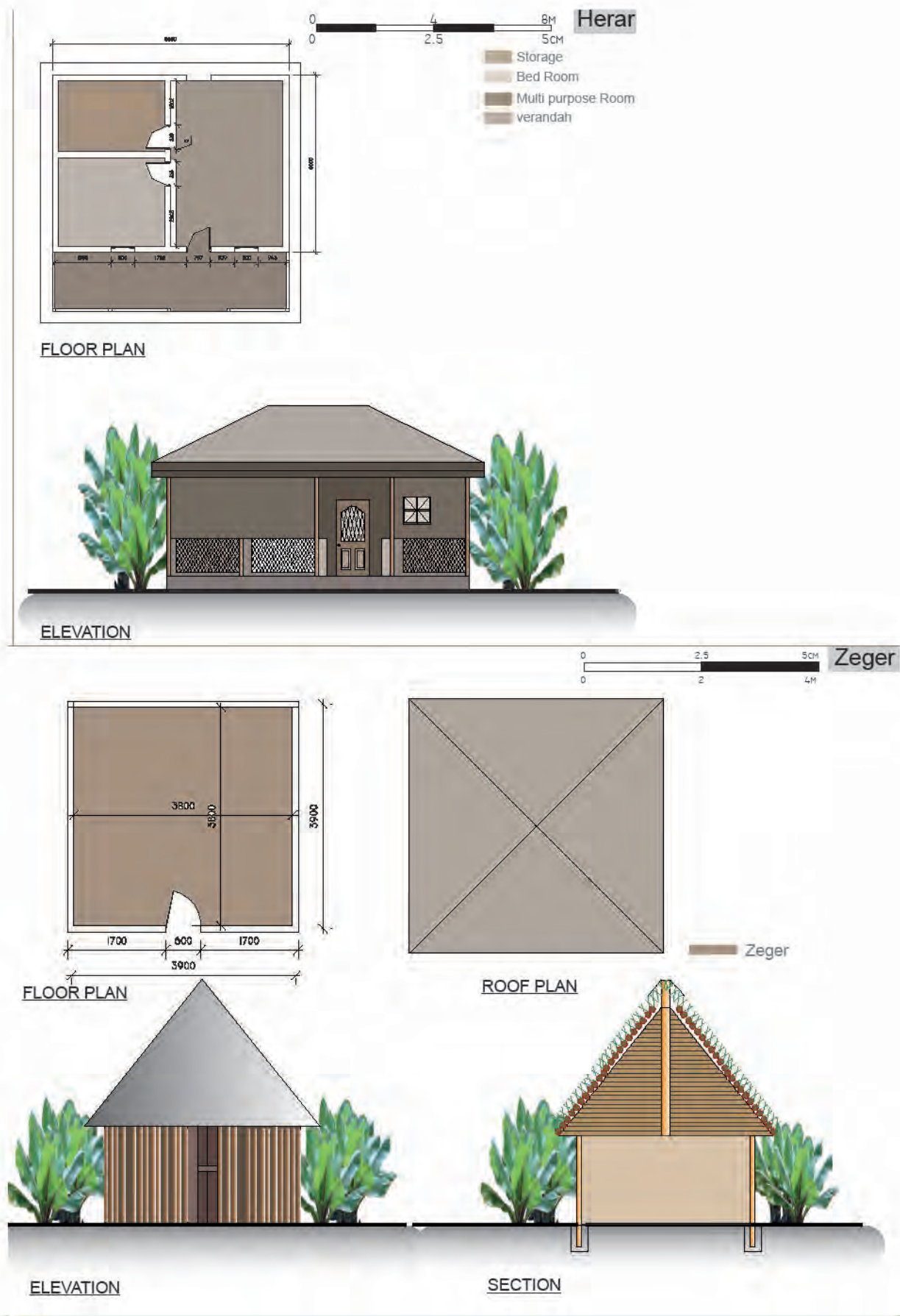


Figure 4.09.a. Graphical Analysis of House unit 2

House Units: 3



Wro Weletemichael is 60 years old widow, has five children and all of them live in town. She meet her children during holly days, except one who lives in Emdibirtown and visit her once or conditionally more time in a week. She lives in, Yeferezye kebele in yerunche got' which is located at 2km to the North direction of Emdibirtown. Her husband passed away few years ago and she lives alone. She generate income through farming by paying labor cost, she produce various farm products from food items to income generating items like fruits and coffee. Her children also support her financially. She owns three house units in her compound. The main house serves a multipurpose like socializing, cooking, storage, barn, sleeping etc. She uses solar energy for light during night time, which is provided by her children from Addis and also uses wood for fuel consumption. Her guest house has a rectangular layout iron sheet covered and cement screed floor finished unit built with the help of her children and has no service till guests arrive, so she lock it and live in the main house. The kitchen is located to the right side of the main house with its squared layout having a roof cover of thatch. She uses a piped water for drinking which is available in her village for the community. She said there is no problem of the roof cover since her husband was dead but even if there is, she said, *"I can use thatch from my back yard to maintain it, thanks to my husband."*

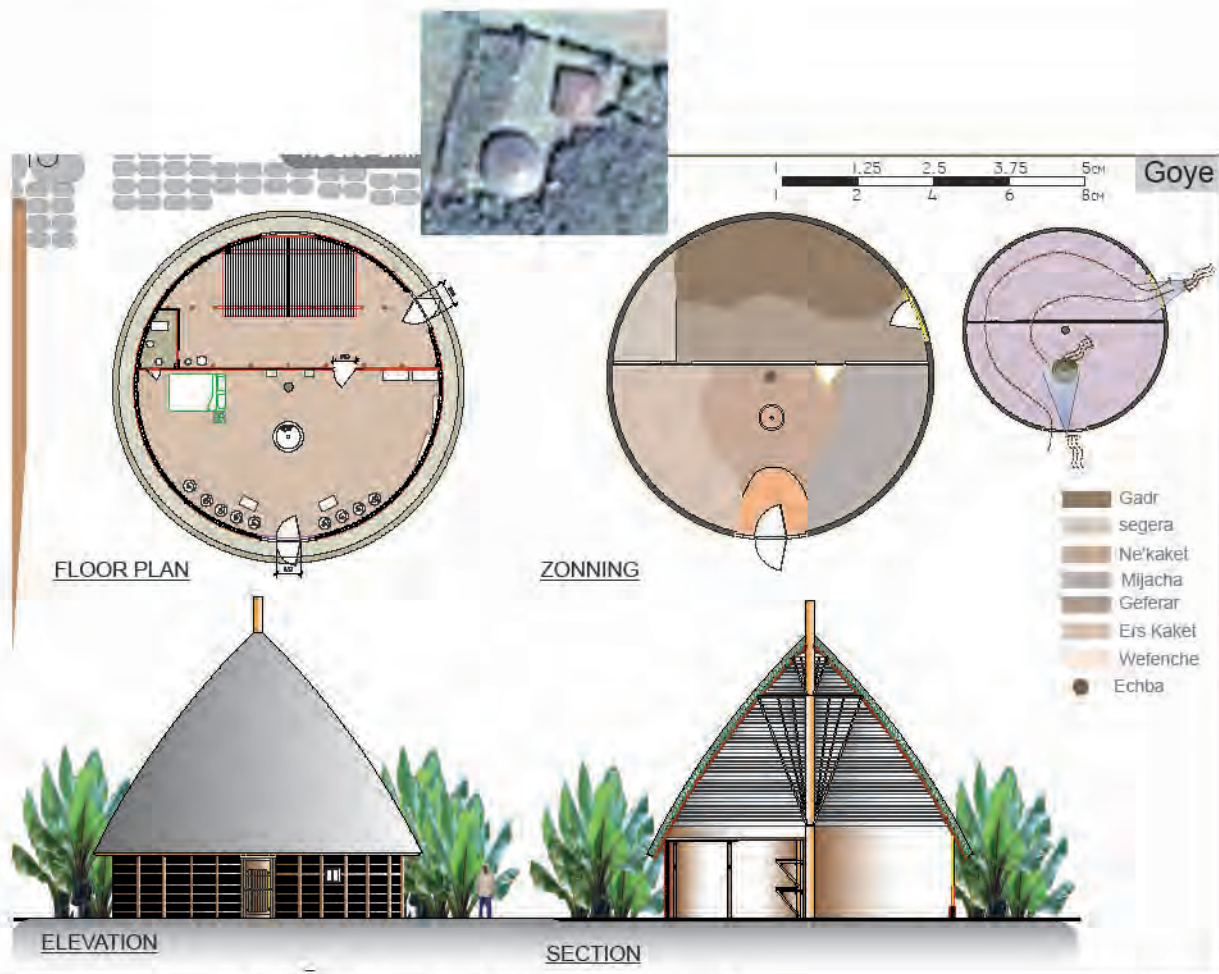


Figure 4.10. Graphical Analysis of House unit 3

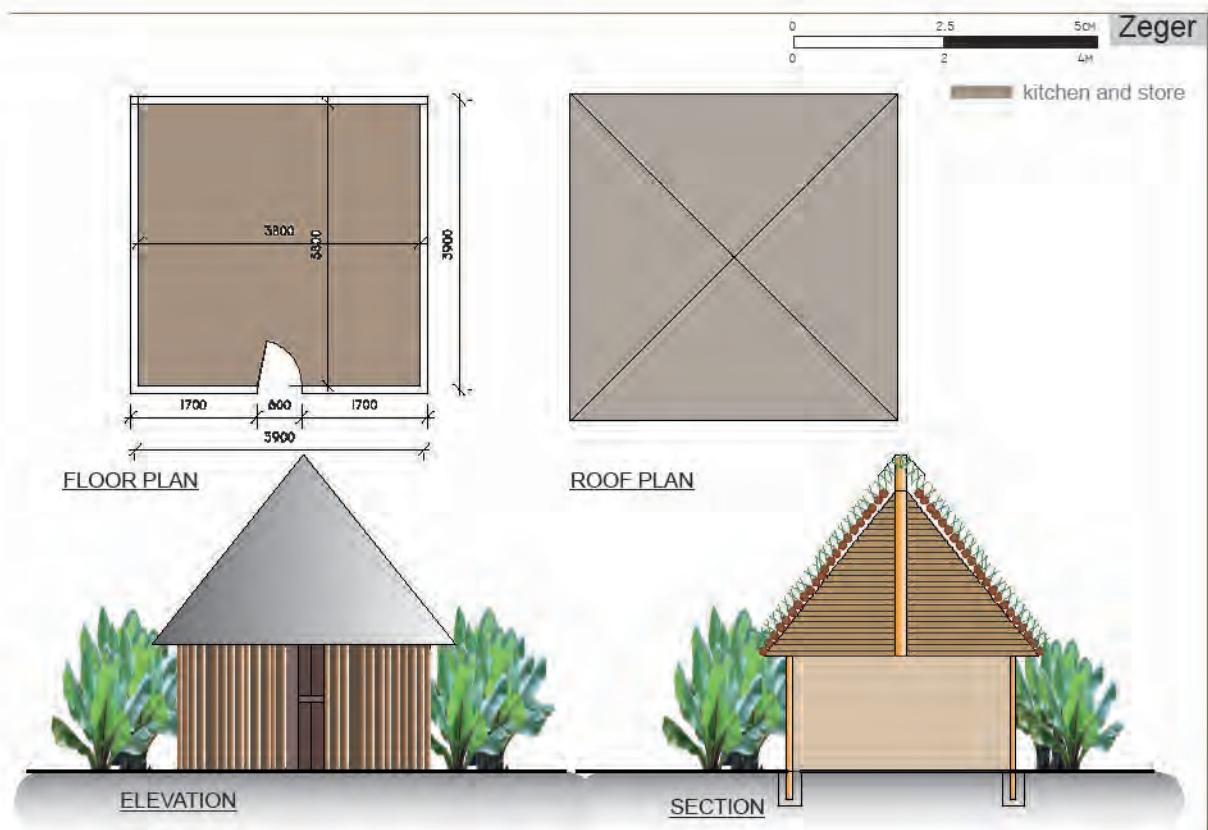
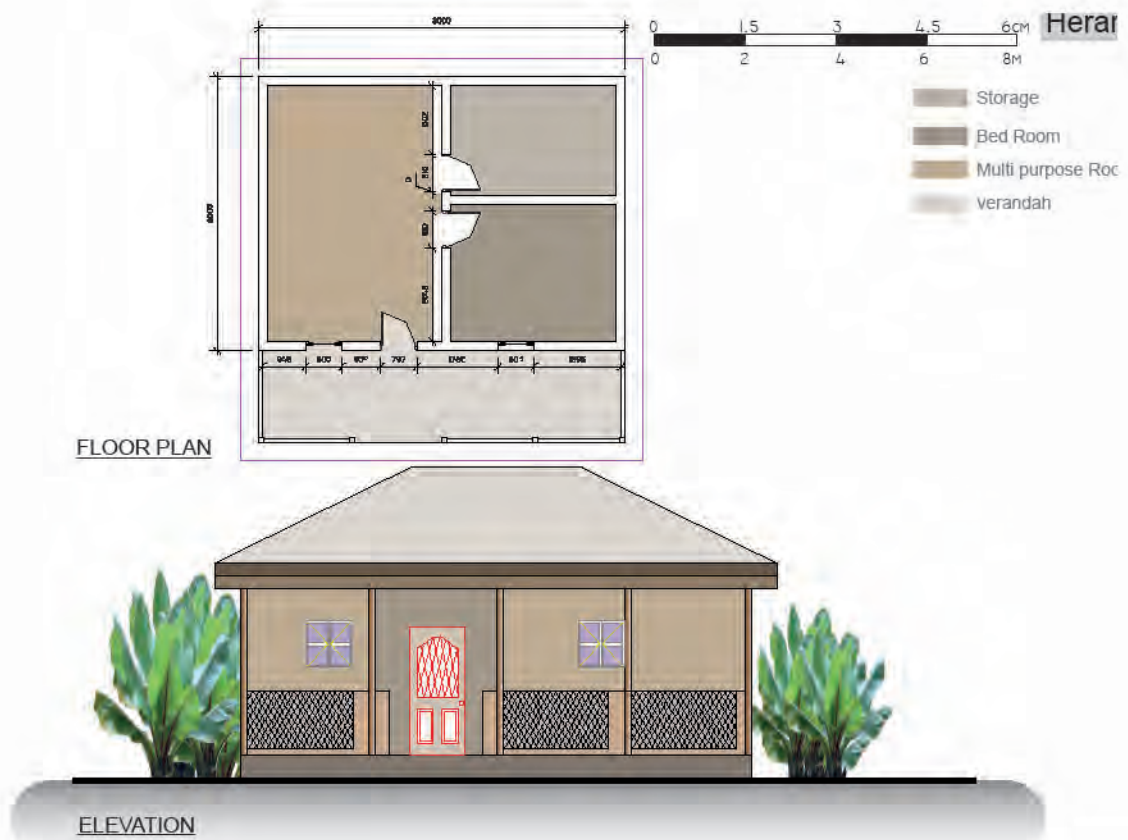


Figure 4.10.a. Graphical Analysis of House unit 3

Case 2
Compound D
Owner Dinku Trarch

Number of houses 5
Front size of compound 65 m
Compound type 'shared'



Compound: D

It belongs to Ato Dinku Trarch who is now more than 100 years old. It is located in a village called Denka 5km to the North West of the capital town *Arekit*. He has two wives and nine children. In the compound where the interview was undertaken there are five house units which include the Main House (*Goye*), the guest house (*Herar*), the kitchen and store (*zeger*) and other two units which belongs to his first son who is a Doctor living in *Jimma* working and teaching in university and hospital, he built one unit of rectangular and one circular shaped houses in his father's compound. Ato Dinku had two *wedero* land, which is around 144m wide compound before his children shared it letting half for him which one of his son is waiting to have this one too. He share his compound with his son's wife meaning two households are sharing the compound. The external border of his compound is fenced using split wood of eucalyptus, sharpened at the tip. It has also internal fence but not as the external one. Circulation foot paths with in the compound are tiled only in front of the two house units of his son with natural stone so that it won't be dirty during rainy season. They use ground water well of their neighbor and sometimes they get clean water from the communal water pump done by NGOs. They use kerosene as energy source for lighting and wood for fuel consumption of cooking and generating heat. No extra infrastructure is provided for the whole settlement where this case is located. As the old man explained most of the past generations in *Gumer wereda* were warriors and even they get this land through civil war; centuries ago where his fourth father was one of the warriors. Since he is very old man he does not participate in farming activities currently, so his children took responsibility of such activities. Children from towns also support him financially and in all possible ways.



Figure 4.14 Site Plan of Compound D
(Google Earth + Overlay)

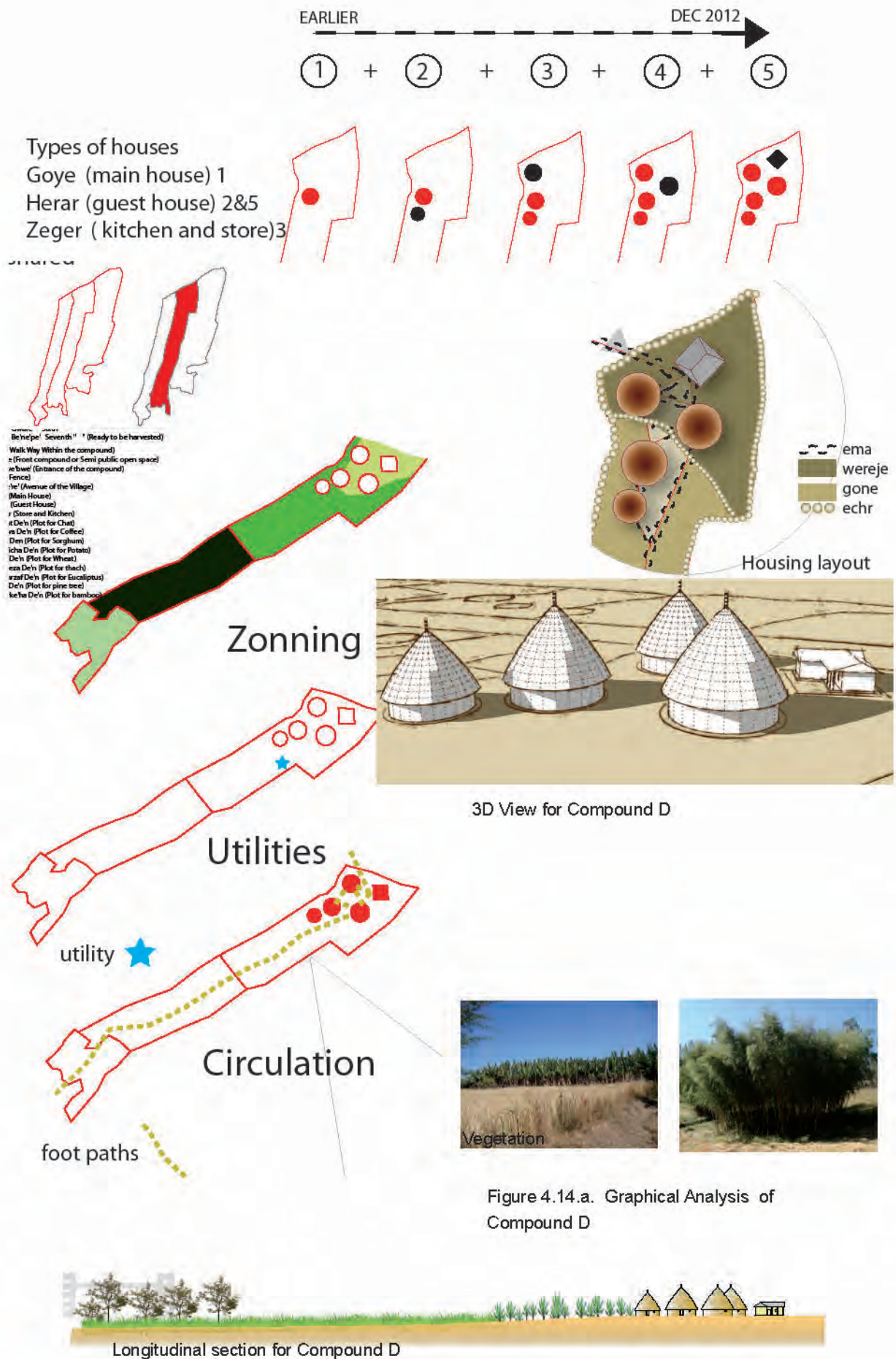


Figure 4.14.a. Graphical Analysis of Compound D

Case 2
Compound F
Owner Kewret Ferej
Number of houses 2
Front size of compound 72 m
Compound type 'private'



Compound: F

W/ro Kerwet Ferej is the Owner of this compound who live with her grandchild and her husband who is blind. She is 67 years old and she is responsible to handle all the works in the house and farm, because of her husband's situation. Her five children visit her once in a year for holy days except one who take care of her son and the family continuously. She has two house units in her compound one main house and one guest house. In addition to its regular purpose, she uses the main house as a storage and kitchen instead of building another unit.

She own a ground water well in her compound which is used for domestic activities but not for drink. Her front yard is defined by the two traditional houses and fence which segregate the front and backyard. She own three cows, including their calves, which serve the family in providing milk. In the back yard she planted *enset* and vegetables. She couldn't produce income generating products because of her situation, so she is obliged to produce only food items through paying for labors to do the hardships in the farming process. She uses electricity for lighting and wood for fuel consumption. She owns $\frac{3}{4}$ *wedero* of land at the frontage which extends from the *jefwere* to the lowest level of the ridge. Within the backyard of her compound she has latrine pit for toilet purpose and at the front yard she has a ground water well for domestic activities like cooking and cleaning.



Figure 4.16. Site Plan of Compound F
(Google Earth + Overlay)

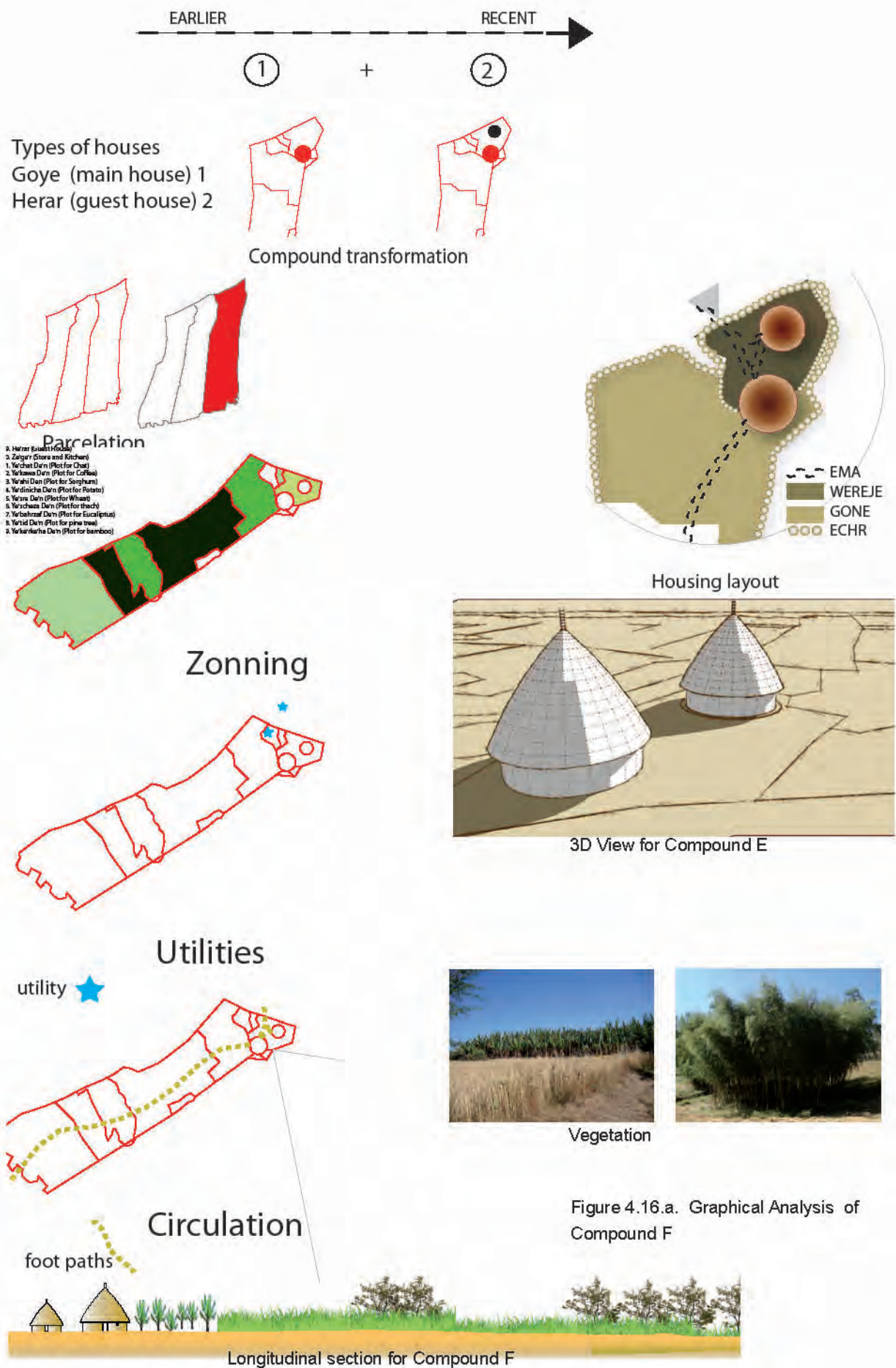


Figure 4.16.a. Graphical Analysis of Compound F



House Units: 5

These units belong to W/ro Kerwet Ferej who is expressed in compound 'F'. She has two house units, as she describes them one is the main house and the other is a guest house. Both units are traditional units made from thatch roofing and a cylindrical wall finished with split bamboo pieces. As it is entered to the main house, from outside, at the front we see a fire place and a central post with its diagonal roof supporting members and to the right there are adjacent spaces called *Geferar* and *Gadr* which is continuous starting from around the entrance to end wall at the back. To the left side of the entrance there is almost a quadrat of the total circular space which is called *kaket* and it is used as a multipurpose space based on time, during the day time this space is used as a living and socializing space and during night time it will be converted to sleeping space just by furnishing a sleeping mat. Towards the back side of this space there is a defined and partially enclosed storage and cooking space called *derar*. This unit has only one entrance at the front. The guest house is mainly used as storage in its partial space, other than that it will be closed throughout the year or till visiting guests come. This unit is located near to the compound entrance and it has been six years since it was built. Split bamboo cladding is use to cover the external wall and plastered with mud in the internal wall on top of which a mixture of ash and cow dung is plastered. The roof is covered with thatch in *gyegerye* detailing.

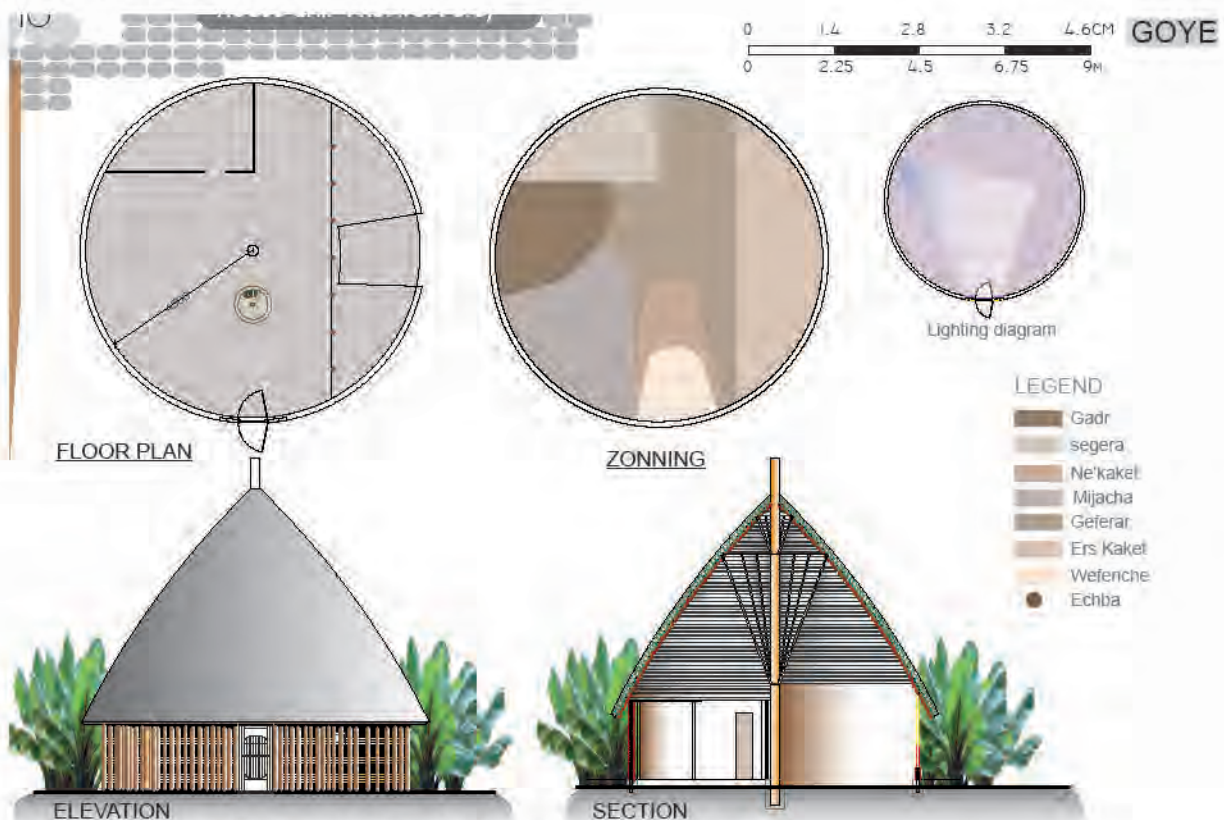


Figure 4.18. Graphical Analysis of House unit 5

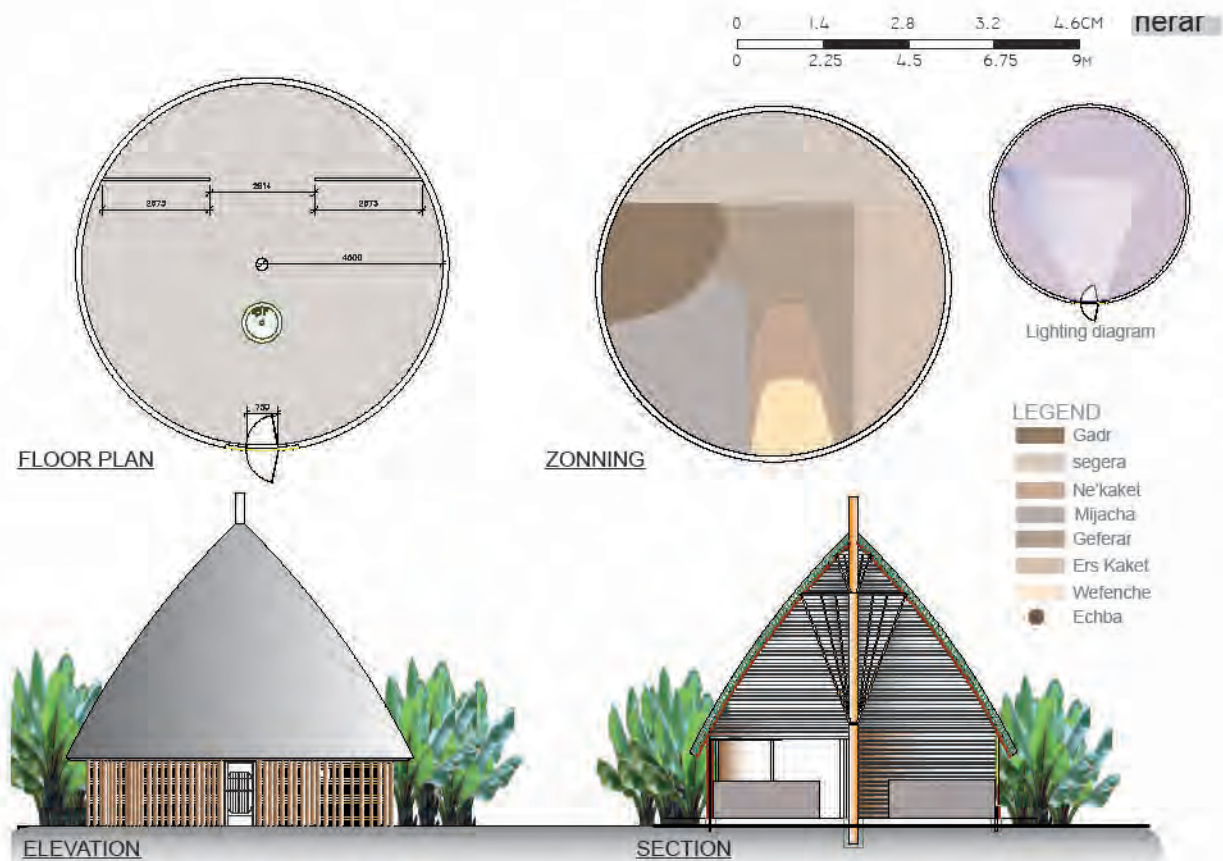


Figure 4.18.a. Graphical Analysis of House unit 5



House Units: 6

W/ro Fettlework is 28, married and has three children; she learns up to grade four and she is a house wife. Her husband is a merchant who has a shop in *Arekit* town. They have two house units in their compound. The first house unit they build was the rectangular one and they build the tukul after some years. Now they mainly use the tukul unit and the rectangular unit as a storage and guest house. Their main house is furnished in a modern style using standard *furnitures* and the interior kept neatly and beautifully. At the center of the wide and two sided *kaket* there are the central post and fire place. The *kaket* is segregated from the *gadr* and *derar* with a wooden partition wall built up to 2.5m high from the ground. At the back of this wall the two spaces exist together having the *kote* and *segera* side by side at the top of the *gadr* and on the ground respectively. They have a back door located near to the right side end of the wooden partition for cattle and human to access the back yard. The rectangular unit used to serve as a main house few years back, but currently its two rooms are serving as a storage and the rest two waiting for a guest to come, till then they are kept empty and locked. They use electricity for lighting during night time and wood as fuel source for cooking and generating heat. There is a traditional fire place in front of the central post which is used for coffee ceremony and generating heat. They also have a fire place at the back of the partition for cooking purpose in the *derar* space.

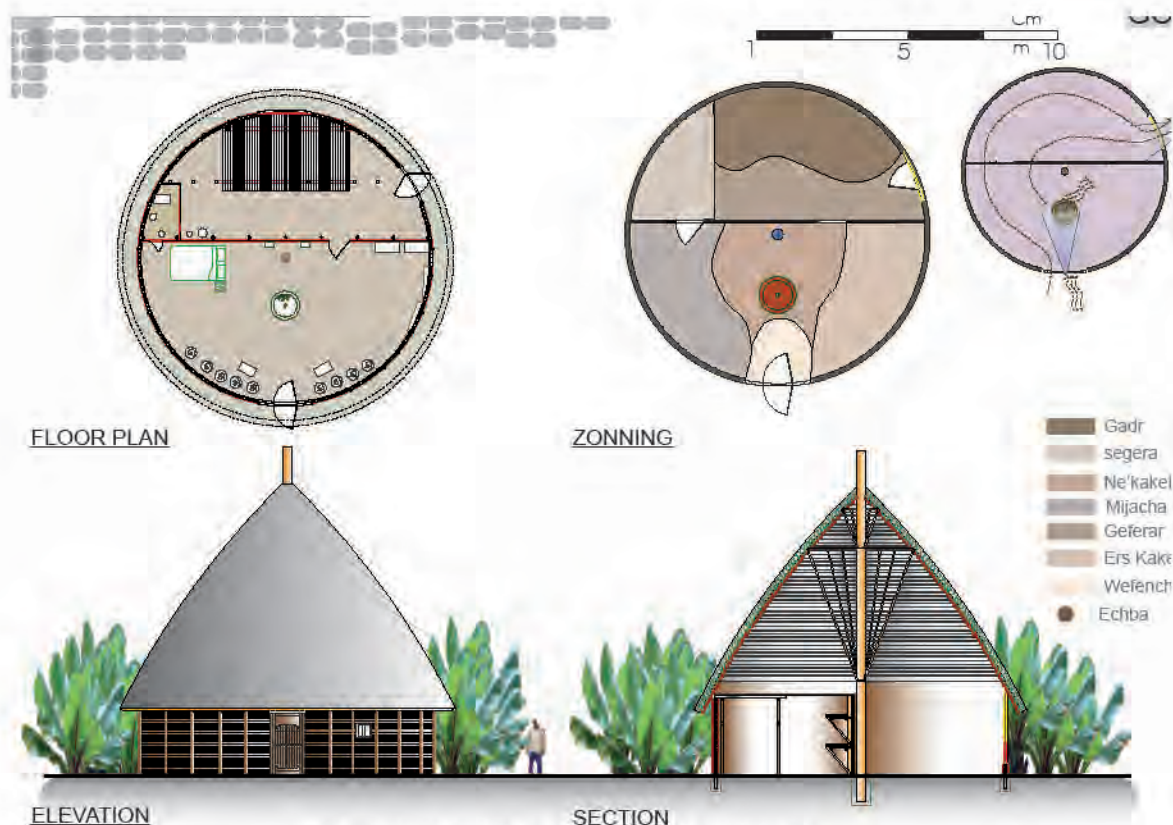


Figure 4.19. Graphical Analysis of House unit 6

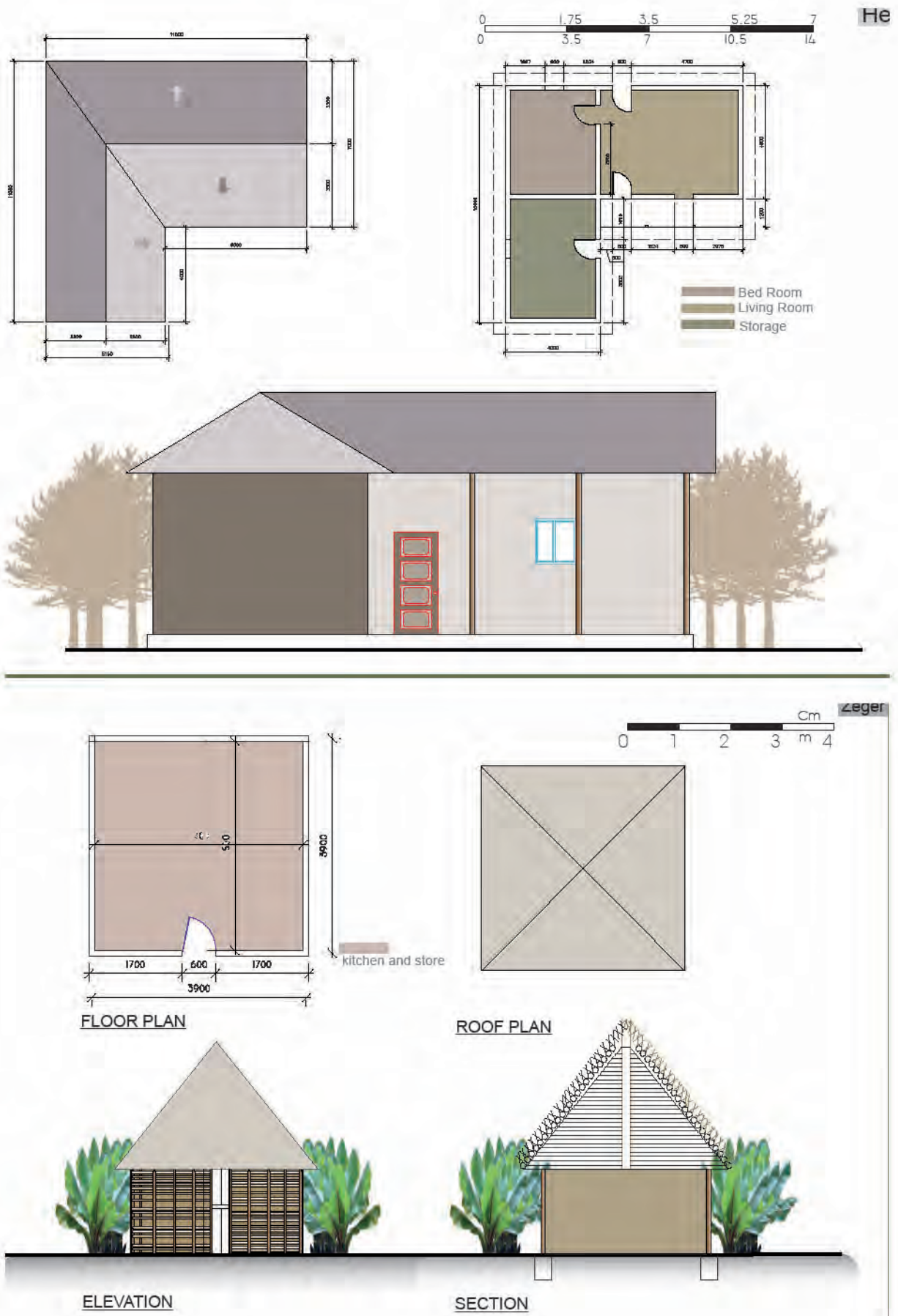


Figure 4.19.a. Graphical Analysis of House unit 6

Case 3
Compound H
Owner Saliha Eman

Number of houses 2
Front size of compound 47m
Compound type 'private'



Compound: H

W/ro Saliha Eman is 42 and has six children two males and four female. Two of her children are living in Addis and one in Arab country. Her husband works as a merchant as well as a farmer. They have two housing units in their compound the main house is a rectangular shaped and covered with corrugated iron sheet and the other one is a traditional tukul under construction which is at the stage of roofing. They used to have tukul as their main house unit long before but one day a fire accident from their nearest neighbor burnt their old tukul and since then they built the corrugated iron sheet house unit with the help of relatives in Addis Ababa. Now they are building new tukul because the gas of wastes from the cattle and smoke from the kitchen is damaging the roof cover of the corrugated iron sheet, so they want to move those functions from the main house to the new one and they are also planning to use it as a guest house partially. Her compound is defined with the rectangular unit, fence with shrubs and the newly built tukul in addition to the *enset* character. They produce *enset* as a main consumption in addition to wheat and sorghum; they also produce vegetables, fruits and other plants useful for construction. She uses kerosene as a source of energy for lighting and wood for cooking, heat generating, coffee ceremony etc.



Figure 4.24 Site Plan of Compound H
(Google Earth + Overlay)

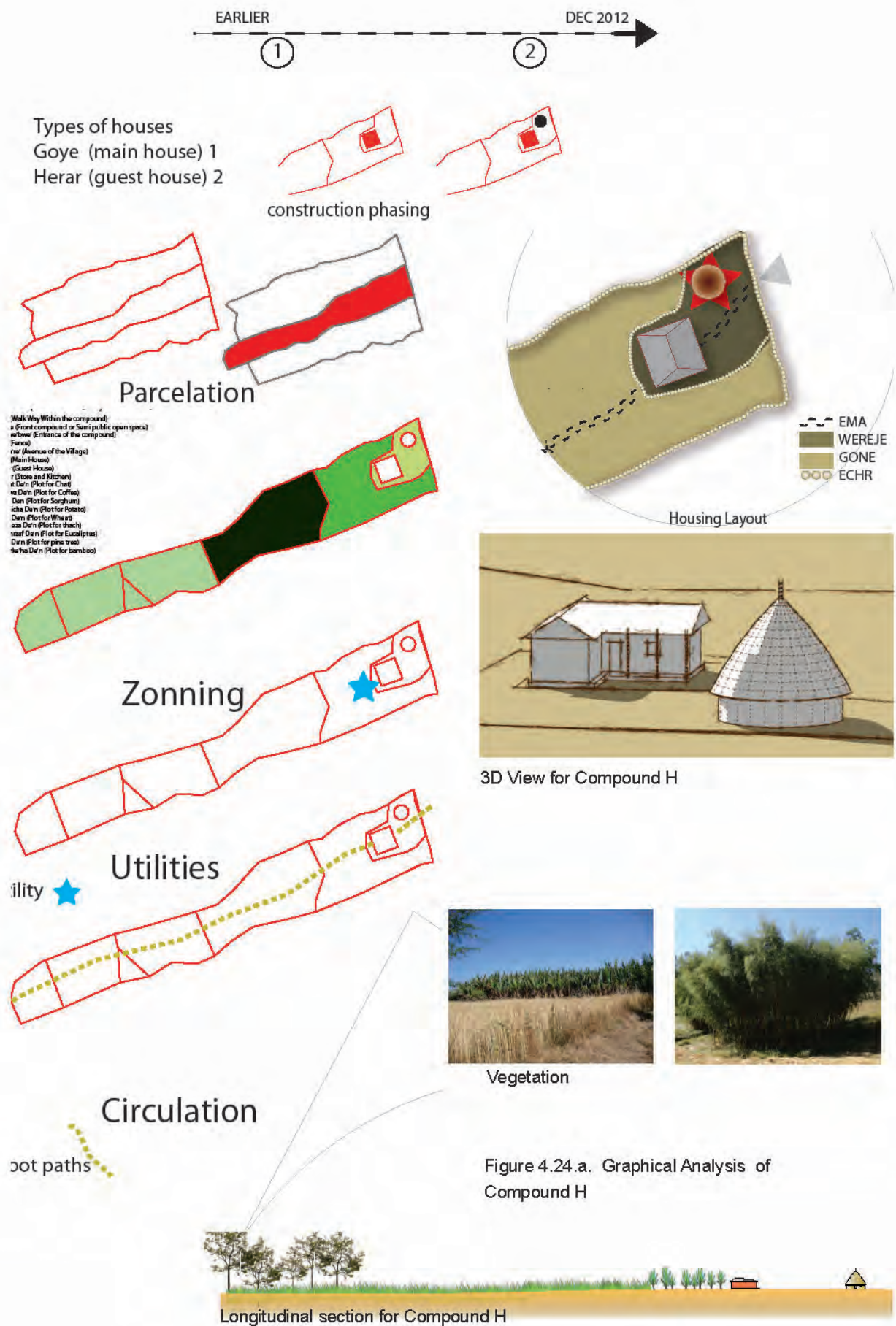


Figure 4.24.a. Graphical Analysis of Compound H

Case 3
Compound I
Owner Ziada Umer

Number of houses 2
Front size of compound 65m
Compound type 'private'



Compound: I

W/ro Ziada Umer is 30 years old woman who has two children one eight years old daughter and six years old son. Her husband works and lives in Addis Ababa and he send her some money for living. She live in same compound with her husband's family and she has one tukul as a main house which serves as everything. Her shared compound is defined by two tukuls and fences, of both external and internal, which divide front and back yard. She produces *enset* and sorghum by paying for workers in the community which is covered by her husband. She also produce vegetables and fruits by her own. The compound measures a total of one *wedero* which is around 72m. she uses wood as a source of energy for cooking and other purposes and she also buy kerosene for her *kuraz* to give her light during night time. Both households use a common latrine pit in the backyard. They own a ground water well at the front yard which they use it for domestic activities like washing clothes, cooking and others.



Figure 4.25 Site Plan of
Compound I (Google Earth +
Overlay)



House Units: 7

As it is explained in compound 'H' W/ro Saliha Eman owns two house units in her compound. The first one they build is the rectangular unit covered with corrugated iron sheet, which was used to as a main house. It has four rooms and verandah at the front, from the verandah it can be entered to the corridor which leads to any room in the house and to the living room where they socialize and use it as a prayer room. This unit is finished with cement screed floor finish and mud plastered and painted wall finish. The floor is a mat topping which is factory made. Currently they are building a new tukul as they explained will be used as a guest house, kitchen and also as a bam, this is because the waste from the cattle and the smoke from the kitchen is damaging the roof sheet so they want to take out those function to the new tukul as soon as they complete the construction process. W/ro saliha explained that she prefers the rectangular unit for the reason that the floor can be cleaned easily by using water only and also it is durable than the traditional one as she remembered the accident as explained in compound 'H'. she uses wood as fuel for cooking and kerosene for lighting during night time. They use ground water well form from their neighbor and have latrine pit in their backyard.

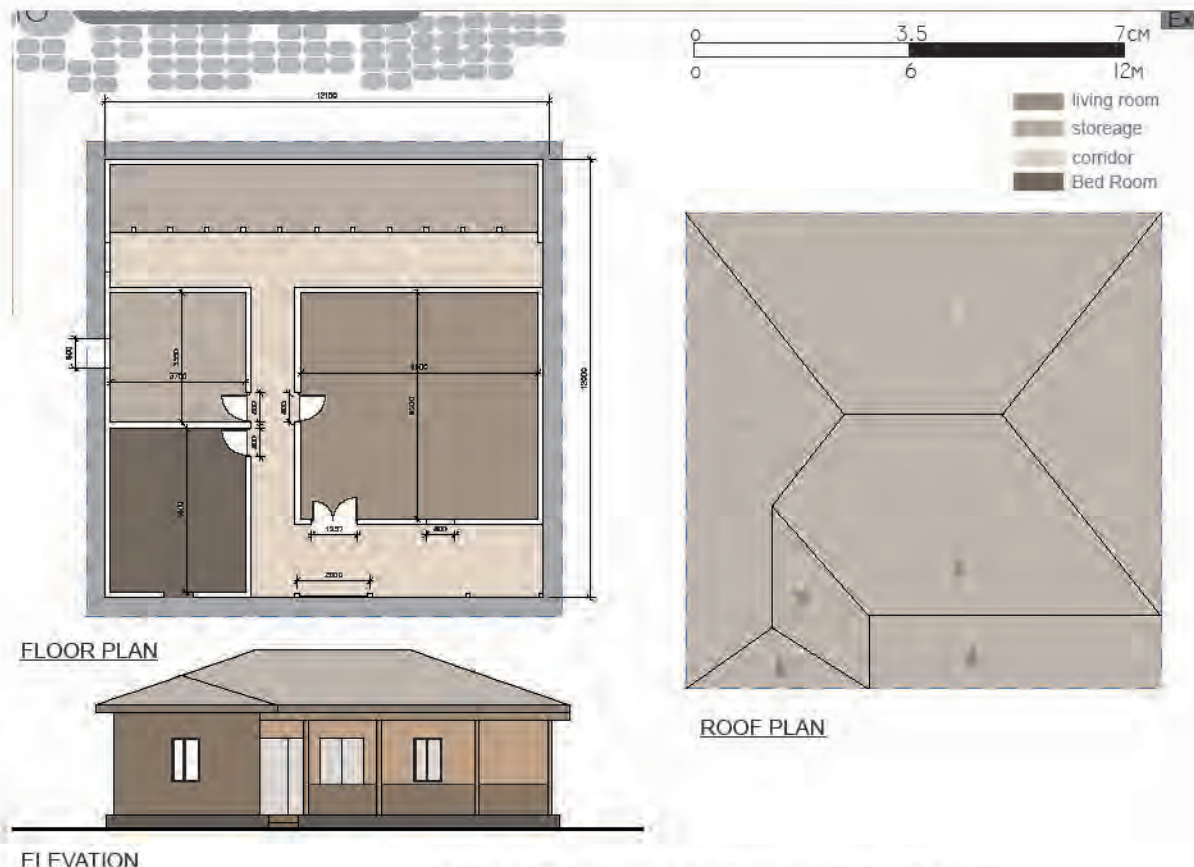


Figure 4.26. Graphical Analysis of House unit 7

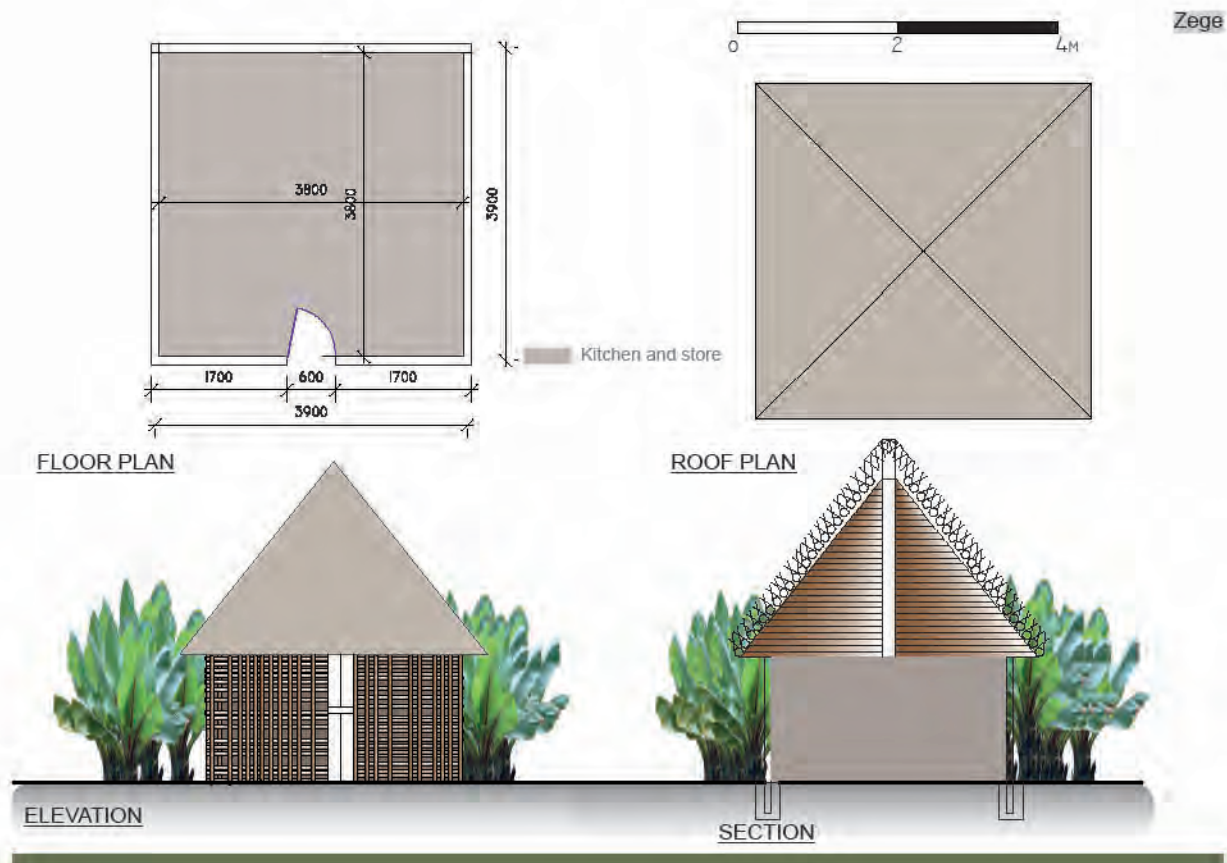


Figure 4.26.a. Graphical Analysis of House unit 7



House Units: 8

W/ro Dinkinesh Mohammed is 40 years old, married and has five children, two of them live in *Nazreth* and three of them live with her. She has two units one tukul which is very old and in a bad physical condition. And as she said they will demolish it as soon as they complete the newly built rectangular unit covered with corrugated iron sheet which has four rooms and verandah. The reason why they choose to build this is because as she explained the local roof cover material which is thatch is getting scarce and expensive, *"I might find thatch just to build a unit but, as it is common, thatch should be replaced every five years in this area, so I could not afford the maintenance cost and labor cost. That is why I let my children who live and work in Nazreth to buy me the roof sheet and nails and I collected the rest of the materials by myself and with the help of the community so that I don't have to worry about maintenance for long period from now on as soon as am done with this one."* She use wood as a fuel source for her cooking activities and other purposes and has a latrine pit in her back yard covered with bamboo waved sheet. She access water from river and ground water well from neighbors.

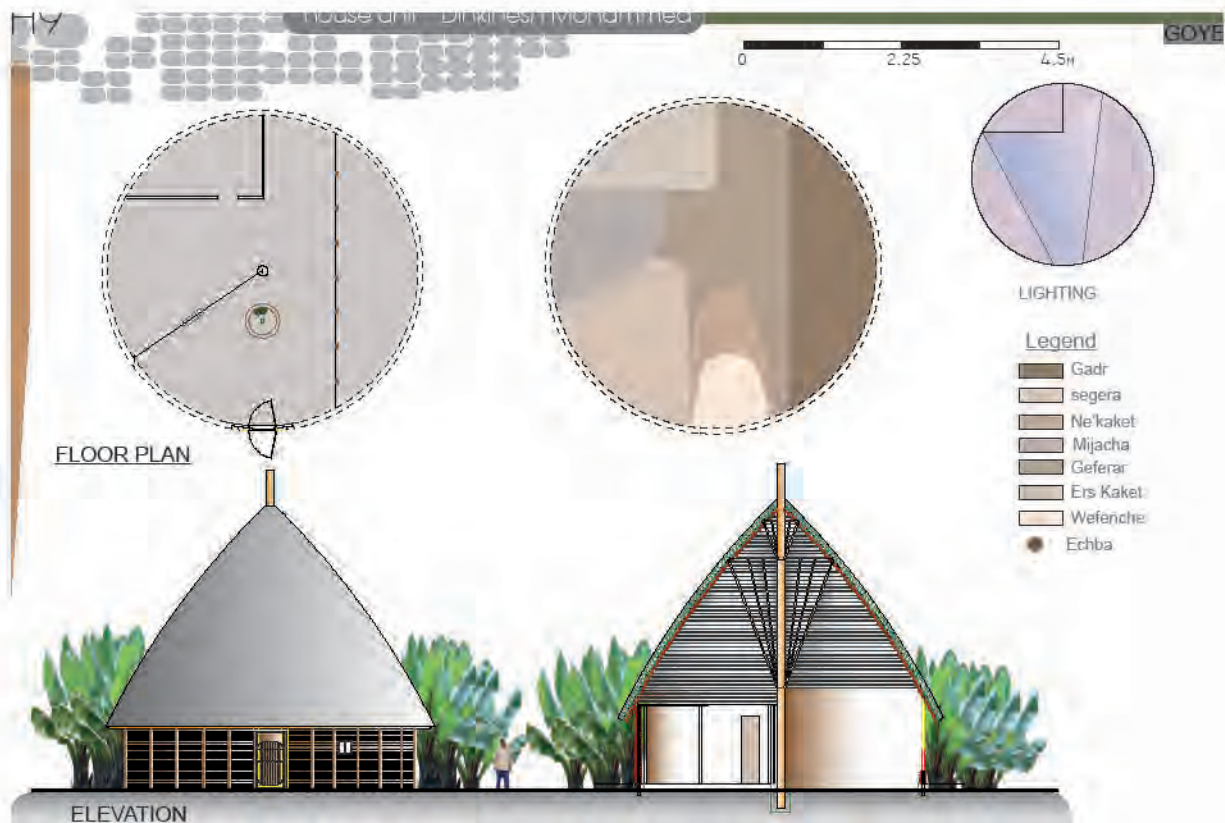


Figure 4.27 Graphical Analysis of House unit 8

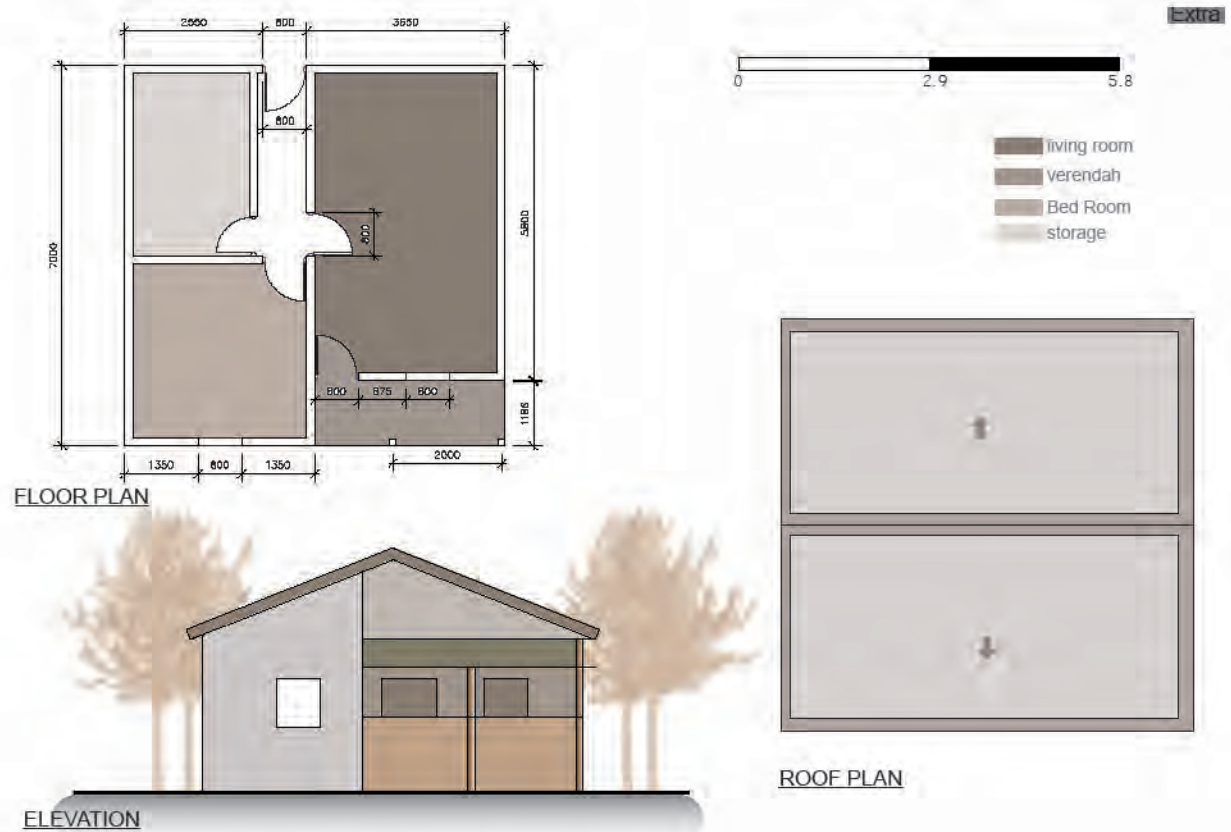


Figure 4.27 a. Graphical Analysis of House unit 8

Case 4
Compound K
Owner Endale Kori

Number of houses 5
Front size of compound 98 m
Compound type 'private'



Compound: K

Ato Endale Kori is 35 years old, married, has three children and he is a teacher in *wereped* elementary school which was built recently in his village *wereped*. He became the owner of this compound when his parents passed away. In his compound there is a tukul of his age and a newly built *korkoro* house before six years. He build the new one because the tukul is getting old but he still likes the tukul and spend his day time in it because it gives him comfort specially during hot days. His wife handles the farm by hiring workers through payment. Mainly they produce *enset*, *chat*, coffee, *teff*, wheat and sorghum. His wife also brew a local alcohol drink (*Areke*) for sell. The other element they have in their compound is a solar panel from which they get energy for their light and recorders.

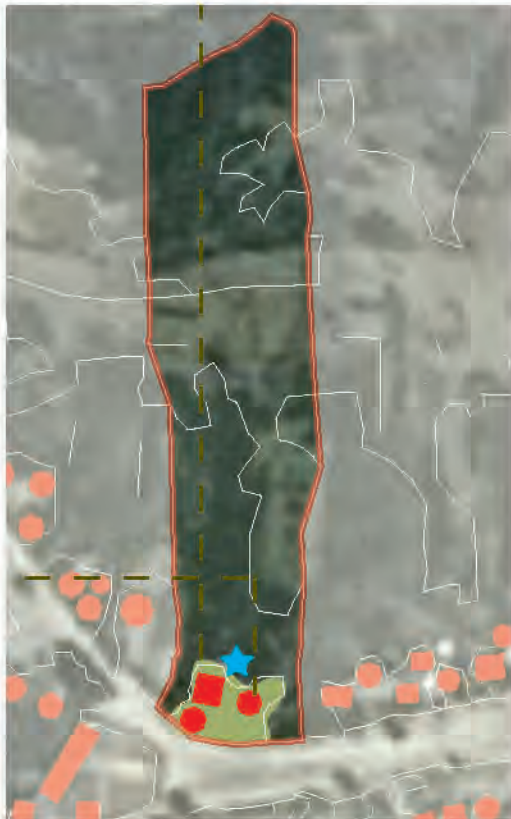


Figure 4.33 Site Plan of Compound K
(Google Earth + Overlay)

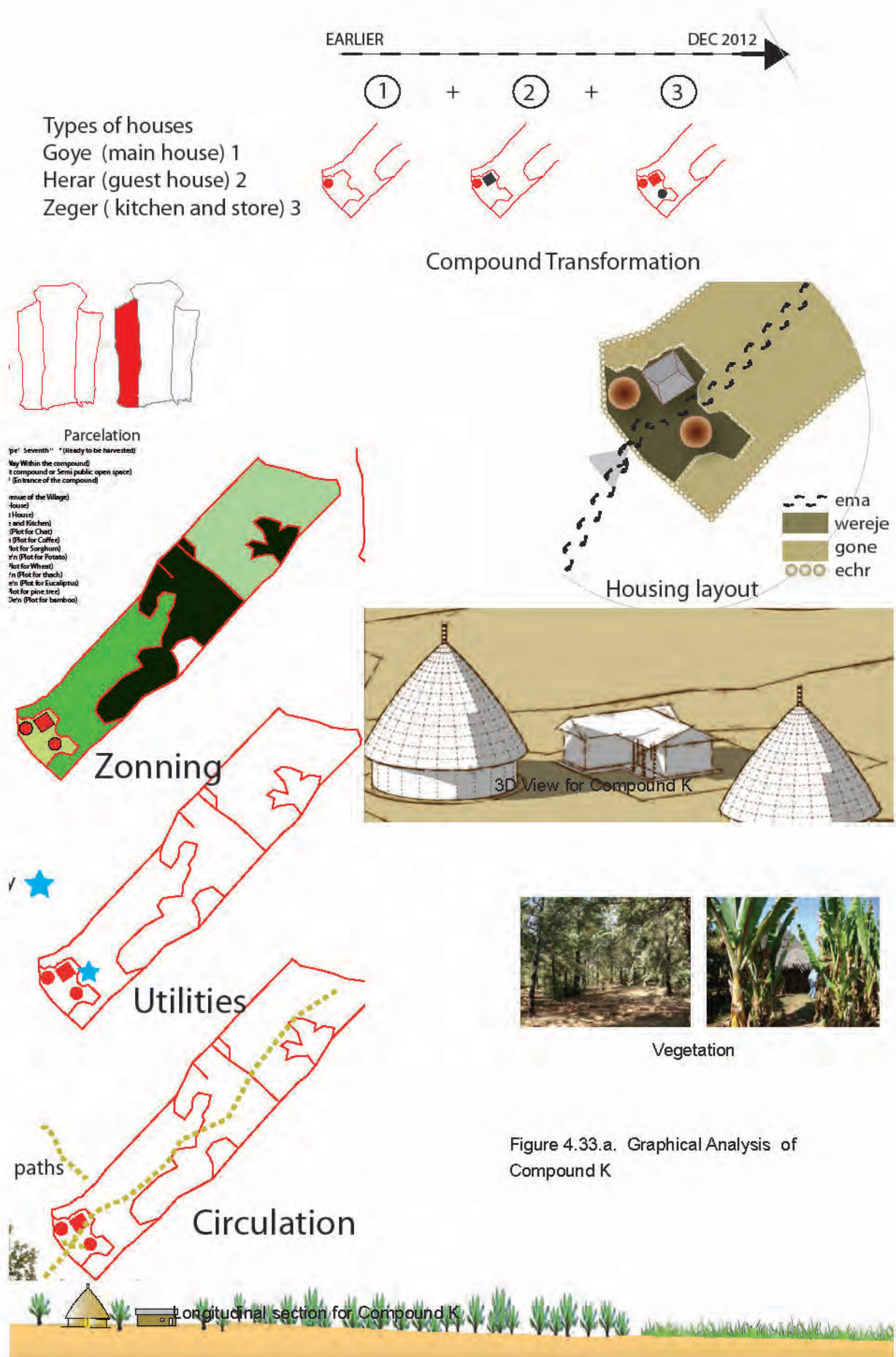


Figure 4.33.a. Graphical Analysis of Compound K

Case 4
Compound L
Owner Wendimu Melis

Number of houses 5
Front size of compound 75 m
Compound type 'shared'



Compound: L

Ato Wendimu Melis is 33, married and have two children. He is a Supplier of Chat for the merchants of Addis, Welkite and other towns by collecting from other farmers and his own. He also produces 'enset', coffee, wheat, 'teff', vegetables and others. He is living with his mother and wife taking responsibility of his father. In his compound he build two 'korkor- bet' units one of which is owned by his brother who lives in other town. And there is also tukul unit which is owned by his mother. It serves as a kitchen, barn, study room, guest house, and day space to take a nap and rest.



Figure 4.34. Site Plan of Compound L
(Google Earth + Overlay)



House Units: 11

Ato Wendimu Melis is a person whose detail is given on compound 'L'. Of the three units in his shared compound one of the rectangular unit is his brother's the other he owns it and the third and the tukul one is owned by his mother. Since his brother does not live there he uses both units with his mother in common. His rectangular unit is finished internally with mud plastering and painting having a metal framed and glazed doors and windows at the front. He still prefer the tukul unit for its comfort and cultural feeling but the durability of the roof cover material is low. Specially this days many people start to use the byproducts from wheat and sorghum replacing a thatch but the problem is it does not exceed more than a maximum of three years and he said replacing a thatch in this frequency is very exhaustive and expensive so he said I prefer to use iron sheet instead. In addition to its durability it gives the feeling of modernity that means it is fashion this days so this is why I prefer the *korkoro* unit. They use the tukul as a guest house, resting space, kitchen and as a barn and storage. And he said my mother still prefers to sleep in this unit but we don't, he said. They use wood as a source of fuel for cooking and kerosene for light during night time. And use water from river and communal ground water pumper.

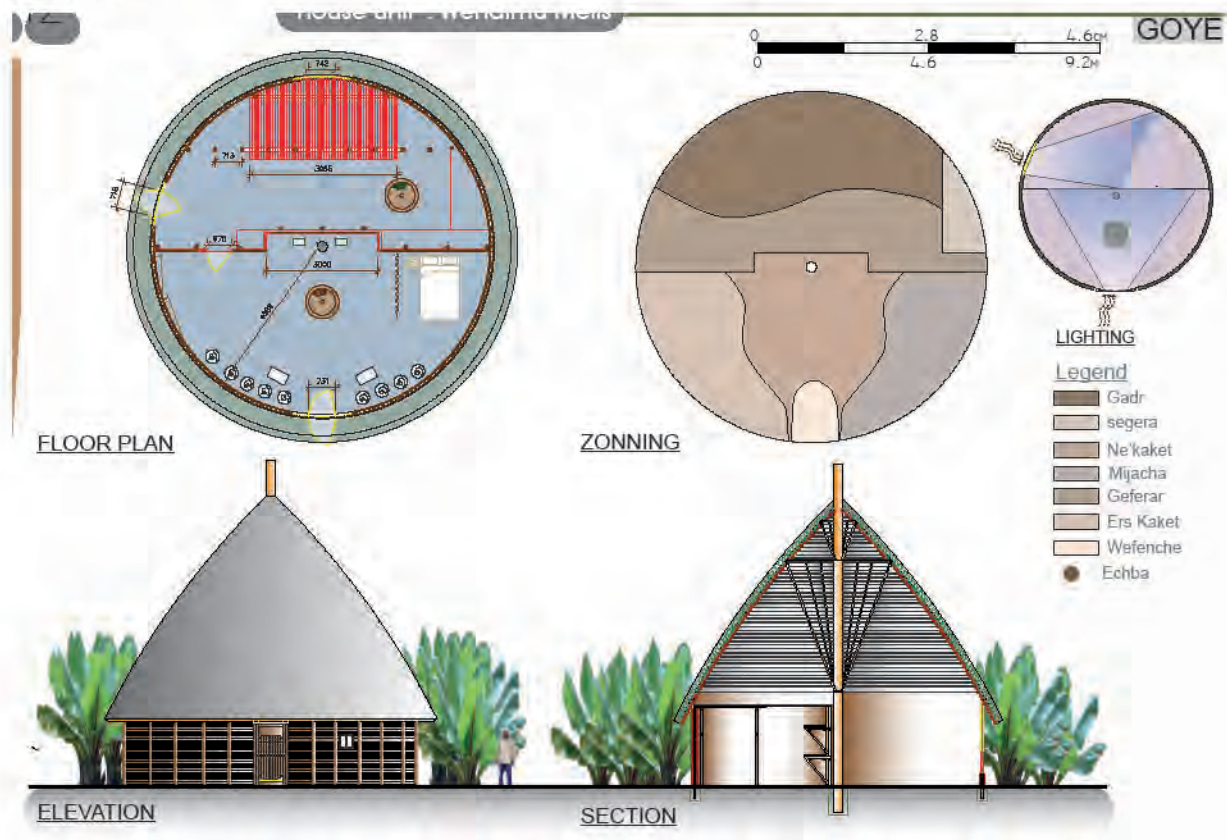


Figure 4.36 Graphical Analysis of House unit 11

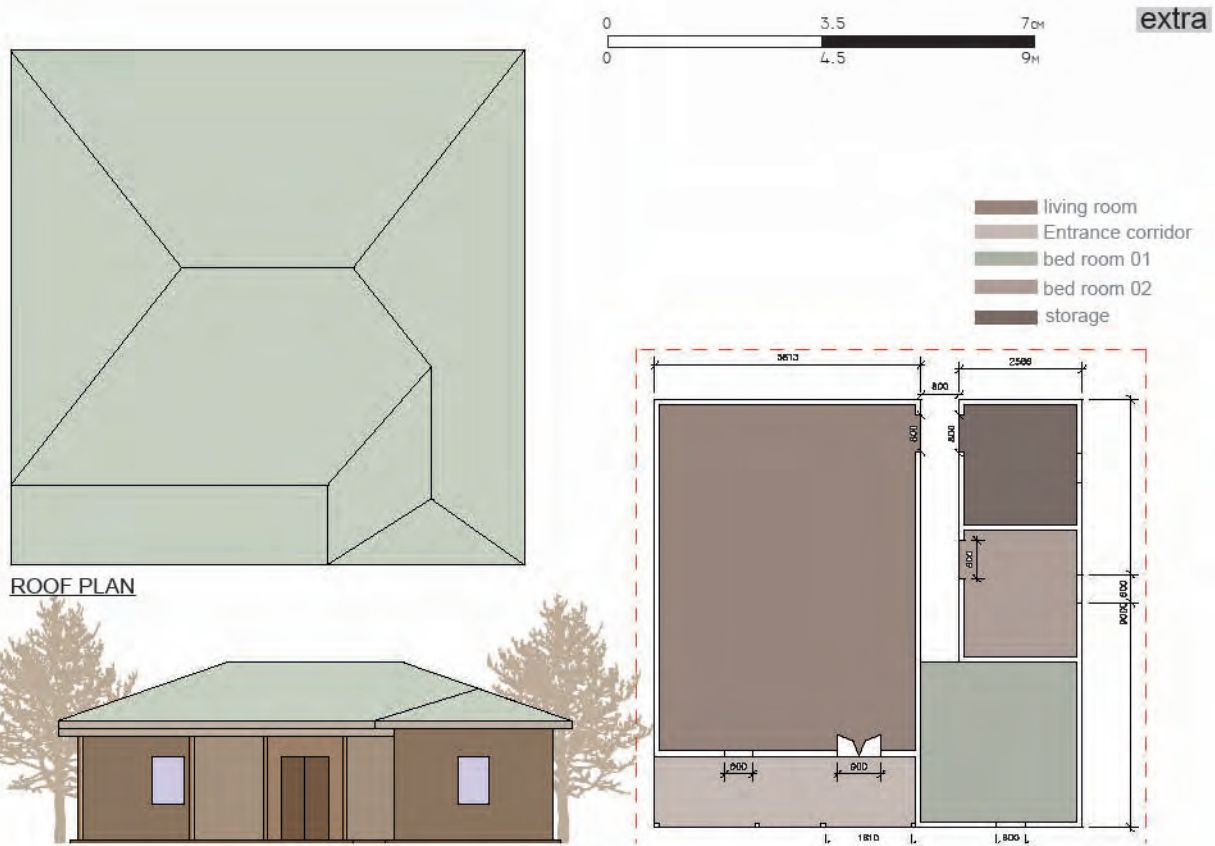


Figure 4.36.a. Graphical and Pictorial Analysis of House unit 11



House Units: 12

Ato Shamil Hassen is 60 and has five children of whom all are married. He shares his compound with his brother. He owns two house units one is main house and the other is guest house. The main house serves as a living space, barn, cooking and storage. The space is divided in to two major parts by using a wooden partition clad with old newspapers. Towards the entrance is a multipurpose space which is living space during day time and sleeping during night time both the right and left sides of the fire place. At the back of the partition wall is where the cooking, storage, and barn. And the guest house unit serves as a storage and prayer room during the five prayer times. It is also used as a guest unit whenever there is. He uses the simple roofing detail which is known as 'Sote' and consumes less quantity of thatch relatively and the reason of choice is scarcity of thatch. He uses river water and ground pumped water. Wood is the major fuel consumption for cooking and generating heat. He has also a simple shade in the back yard to serve as a toilet.

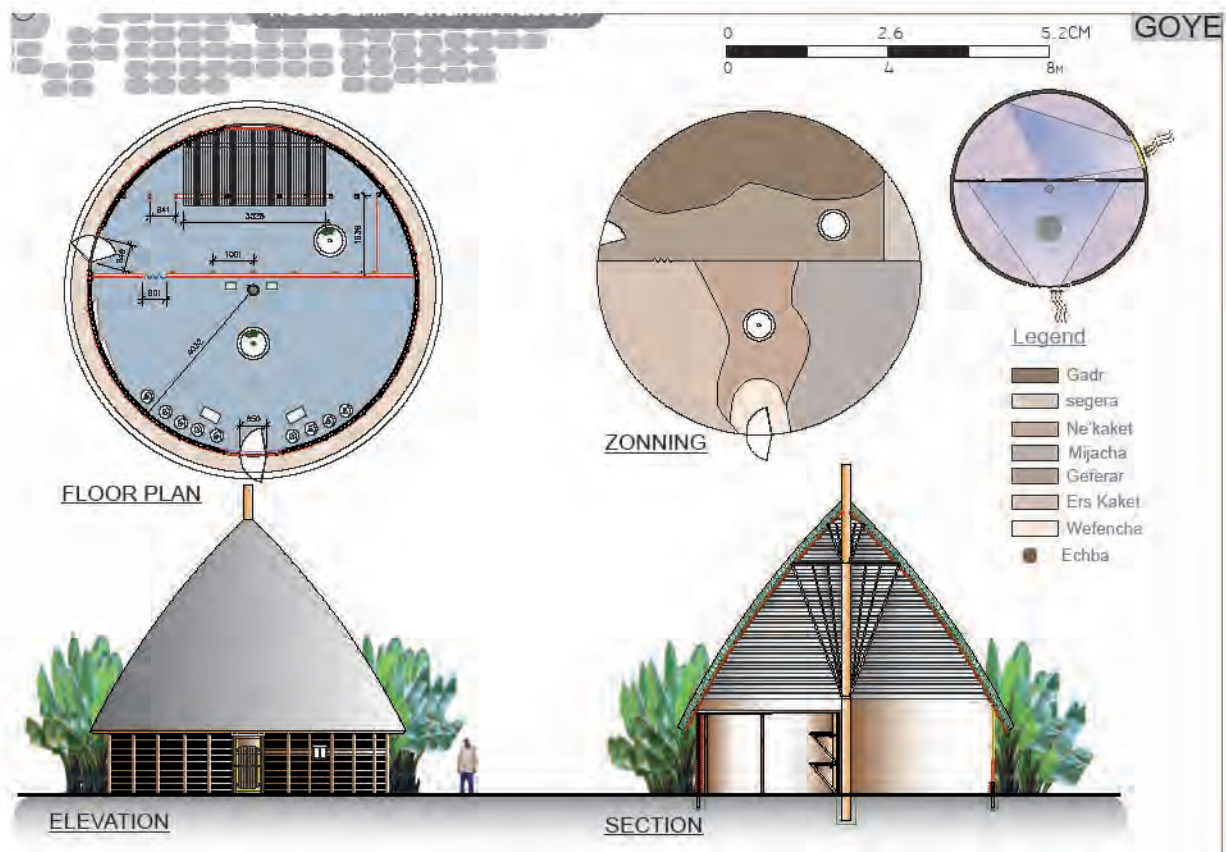


Figure 4.37 Graphical Analysis of House unit 12

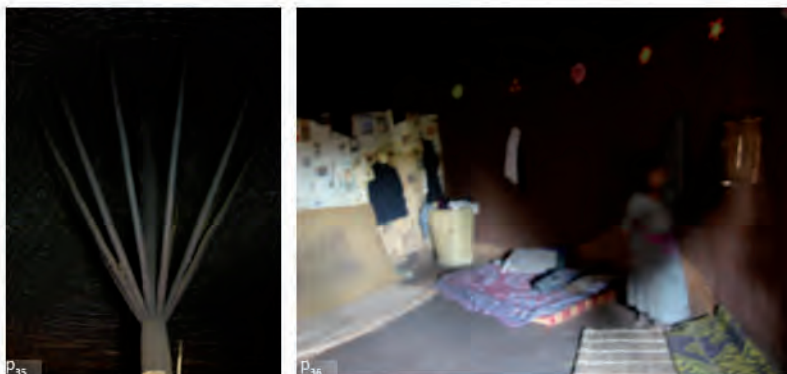
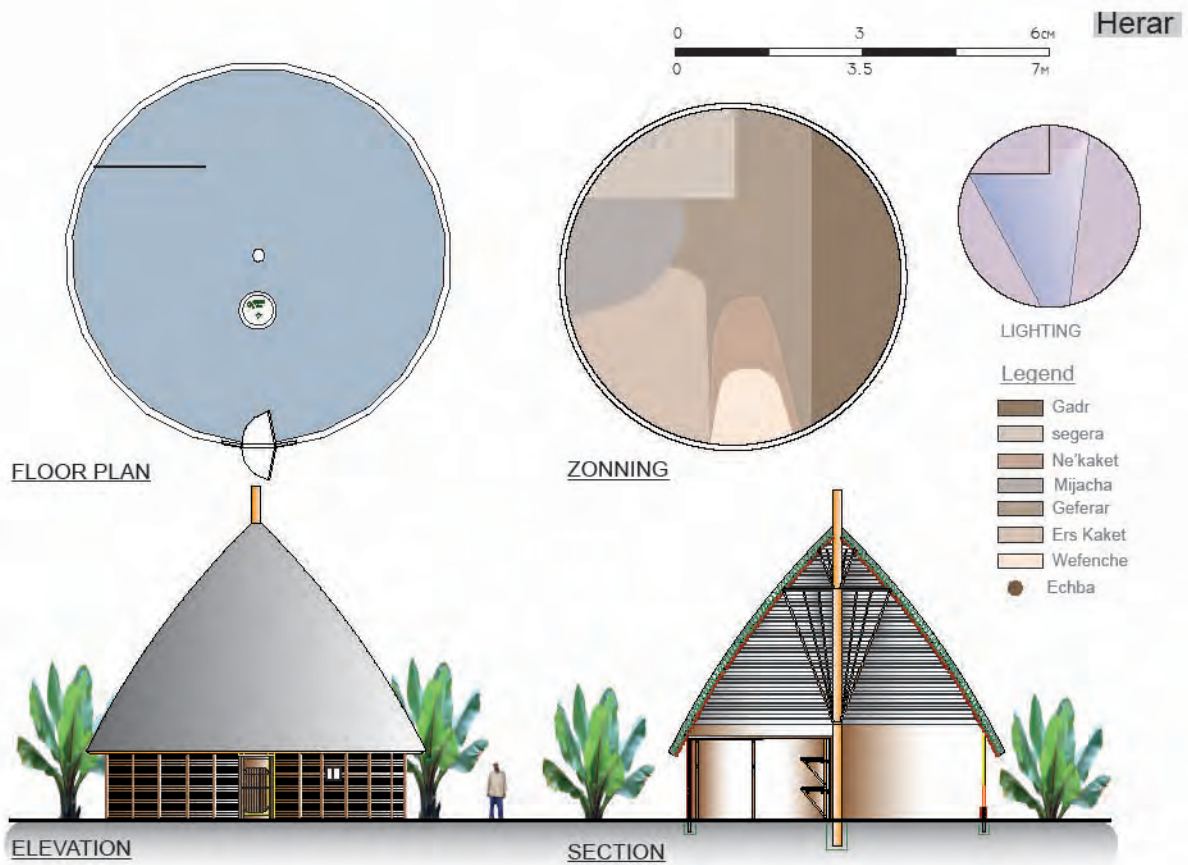


Figure 4.37.a. Graphical and Pictorial Analysis of House unit 12

Case 5
Compound M
Owner Bade Mani

Number of houses 3
Front size of compound 63 m
Compound type 'private'



Compound: M

Ato Bade Mani is 57, has 6 children one of them live with him sharing same compound. This compound is composed of three house units and fences surrounding and defining the front yard and they cultivate various plantations at the back yard. He lead his life based on his farm just behind his tukul. He produces *enset*, wheat, *Teff*, Sorghum, fruits, vegetables, coffee, chat in alliance with his son living with him. One of the three house units in the compound is *korkoro* bet which belongs to his son, one tukul serving as main house and one square shaped unit covered with pyramidal volume roof covered with thatch. This compound is located in *desene jefwere* at *kotchabit* got'. They have piped water in their compound and they also have electricity to their units. They use wood as a source of fuel for cooking and generating heat. They have a shaded latrine pit in their backyard where they use it as a toilet.

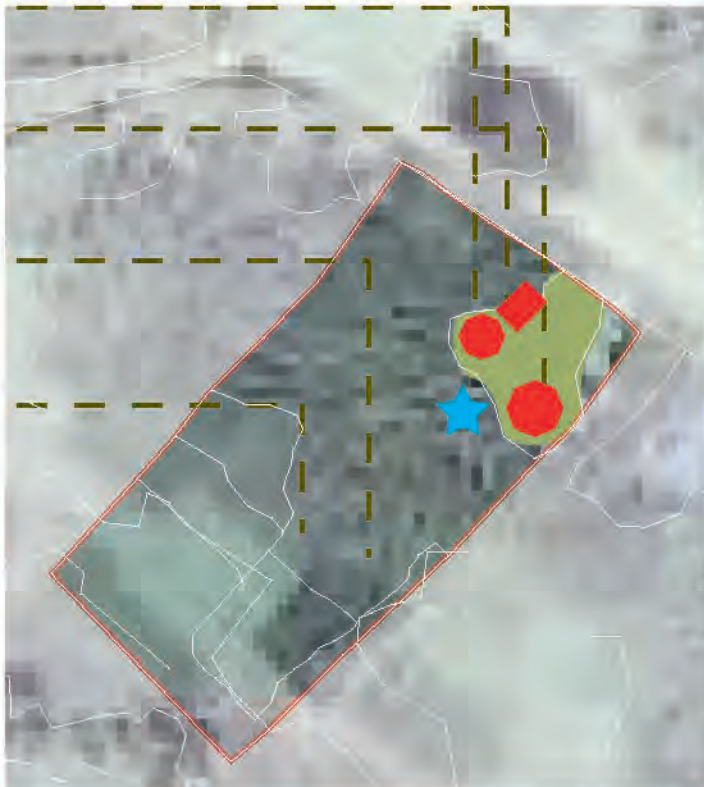


Figure 4.41 Site Plan of Compound M
(Google Earth + Overlay)

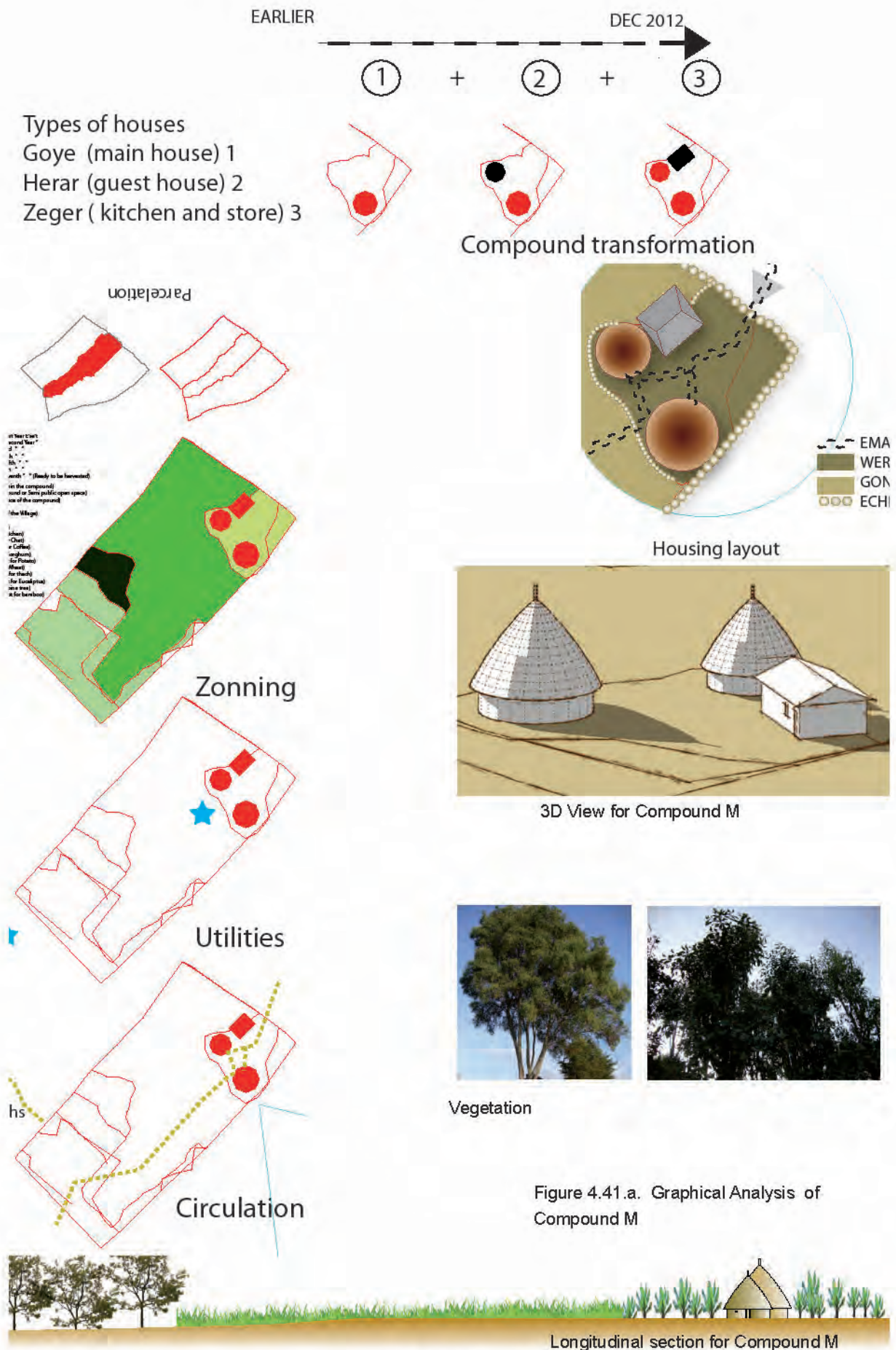


Figure 4.41.a. Graphical Analysis of Compound M

Case 5
Compound O
Owner Yoseph Abrham
Number of houses 2
Front size of compound 60 m
Compound type 'private'



Compound: O

Ato Yoseph Abreham is 24 who is one of the grand child of the owner of this compound, he visit them frequently from the town where he lives *Agena*. His Grandparents went to Addis to visit their children. As he told me it is their son who builds the new *korkoro* bet unit to be used as a guest house and whenever their children came they spent their time in it. He also explained that it is preferred, both for its durability and showing status also the thought of modernity and fashion. They also have the main unit in tukul which serve them as a kitchen, barn, storage, sleeping, socializing etc. since his grandparents are very old their children send money for the farming activities in the backyard. They use kerosene for lighting source and wood for cooking and generating heat. They use water from river and also from communal ground water pump place in the center of the *jefwere*. Their compound has both internal and external fence in addition to some plants and *enset*. They also have shaded latrine pit in their backyard for toilet use.



Figure 4.43 Site Plan of Compound O
(Google Earth + Overlay)

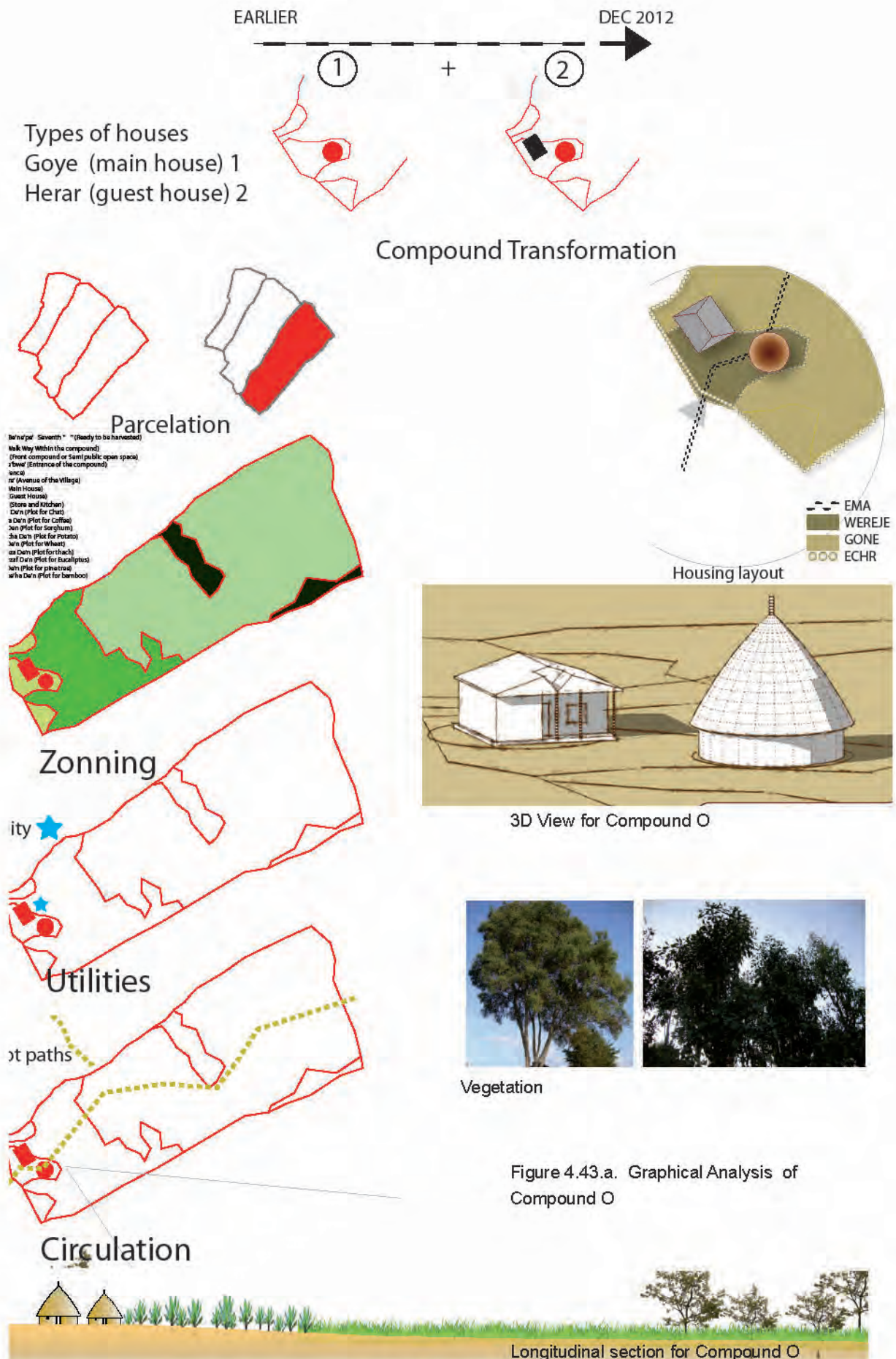


Figure 4.43.a. Graphical Analysis of Compound O



House Units: 14

Ato Yoseph Abraham a grandson of the owner of these house units as it is explained in compound 'O'. Of the two units one is tukul and it is in this tukul where every activity undertaken, activities like socializing, cooking, sleeping, barn and storage. The internal space is defined using simple elements like the central post, fireplace and a short wooden wall as they call it *agdata* which start just behind the central post giving a wide circulation gap to the left and right side of the post till it touches the wall. It basically gives a sense of segregation between the public and cattle space. This unit has two doors positioned at the front and the left side just at the back side of the partition where the traditional shelf (*segera*) is placed. The rectangular unit is serving as a guest house and storage. It is not used intensively and it was closed at the time of the interview with Yoseph. This unit is built by his uncle for his parents and also for themselves whenever they come to visit their parents. Doors and windows at the front facade of this unit are made with glazed metal frames. They use kerosene for lighting source and wood for cooking and generating heat. They use water from river and also from communal ground water pump place in the center of the *jefwere*.

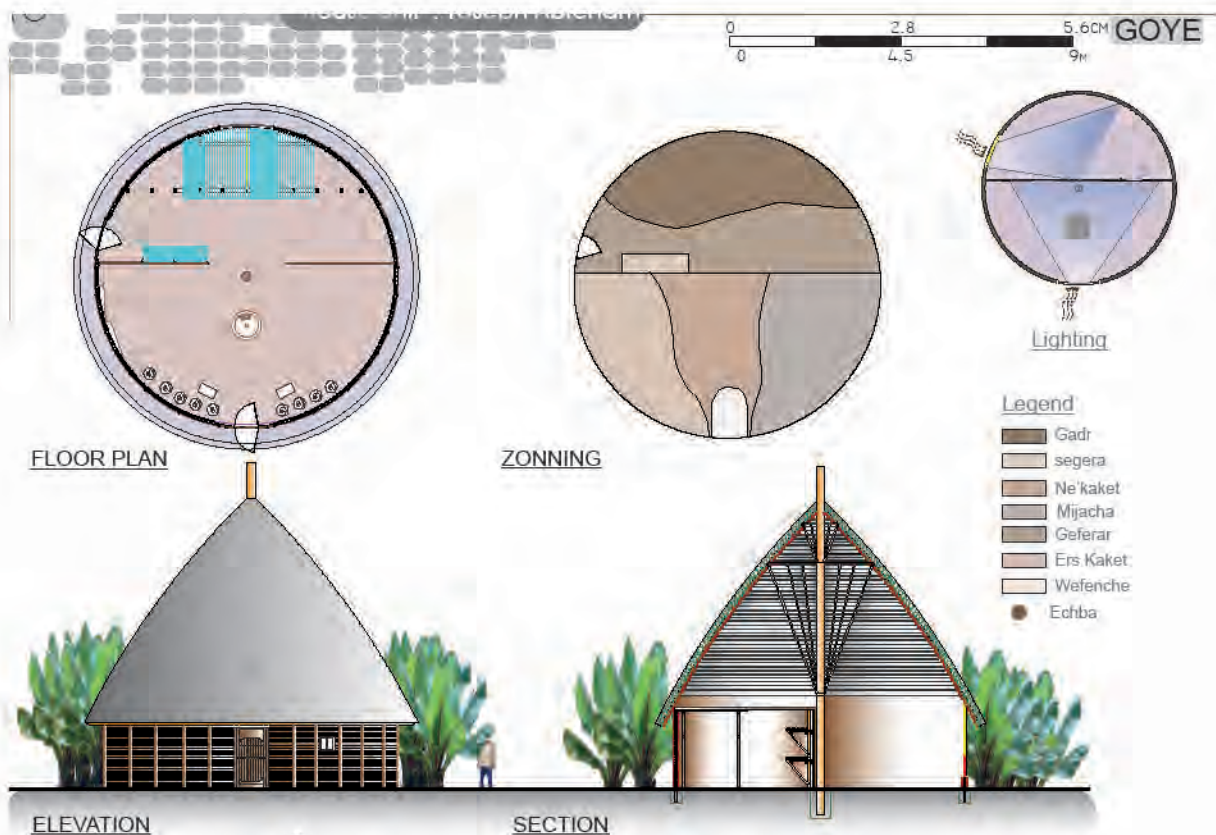


Figure 4.45. Graphical Analysis of House unit 14

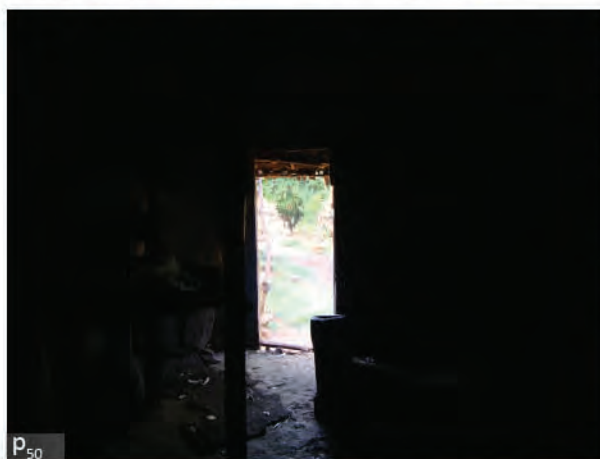


Figure 4.45.a. Graphical and Pictorial Analysis of House unit 14



House Units: 15

Ato Kassa Asdane is 54, married and has five children; he is a teacher as well as a farmer. He lives in *desene jefwere bideret got'*. In his compound there are three units one main house in the rectangular form, guest house in the circular tukul and the kitchen and store in a square shaped layout covered with thatch roof. As he explained whoever builds the rectangular unit with iron sheet he or she must have the tukul unit with it, as he continue to explain, it is because of the cattle as it is known the *Gurage* life is highly based on *enset* and its products and this products cannot be managed without milk products and the cattle need the thatch roofed unit to give excellent output so, that is why I said every *Gurage* should have one unit of tukul. He told me this for my question Isn't the traditional house unit of the *Gurage* becoming lost? And he said No it won't and it is because of the above reason as he believes. As he said, that is what he did in his compound. He manages to build the rectangular unit through his children support. He also uses solar energy for his light, tape recorder and radio. He is using the guest house also as a barn through dividing it with wooden partition and creating access through the back yard side. He incorporate latrine pit in his back yard for toilet use. They use river water for domestic activities and pumped water for drink.

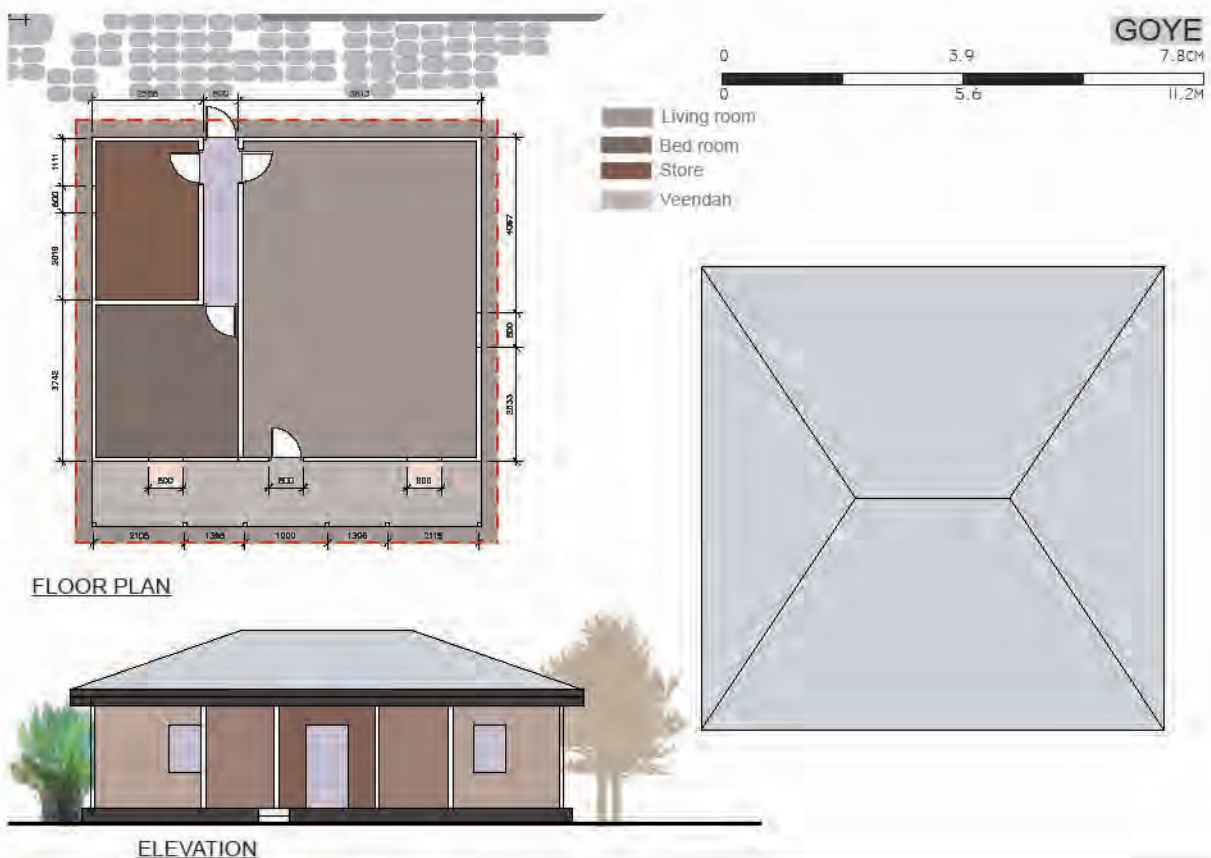


Figure 4.46. Graphical Analysis of House unit 15

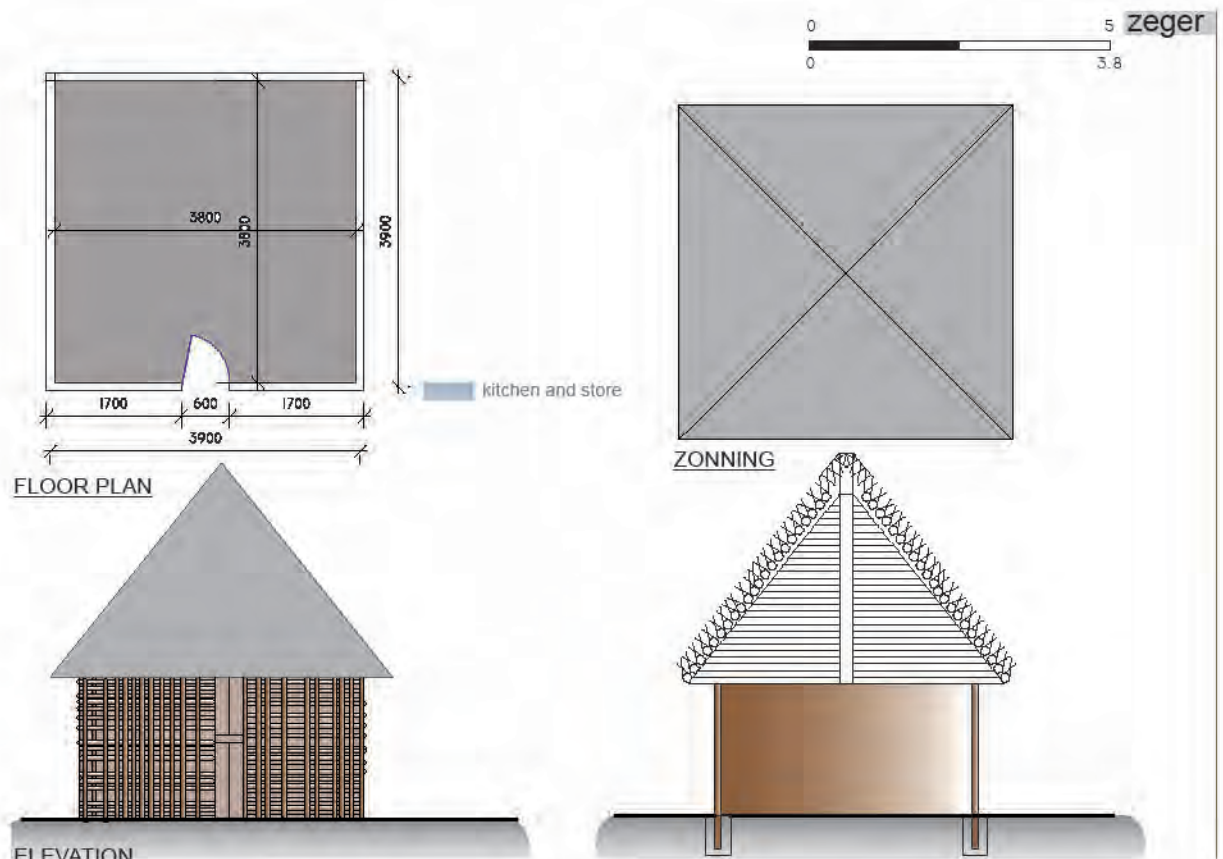
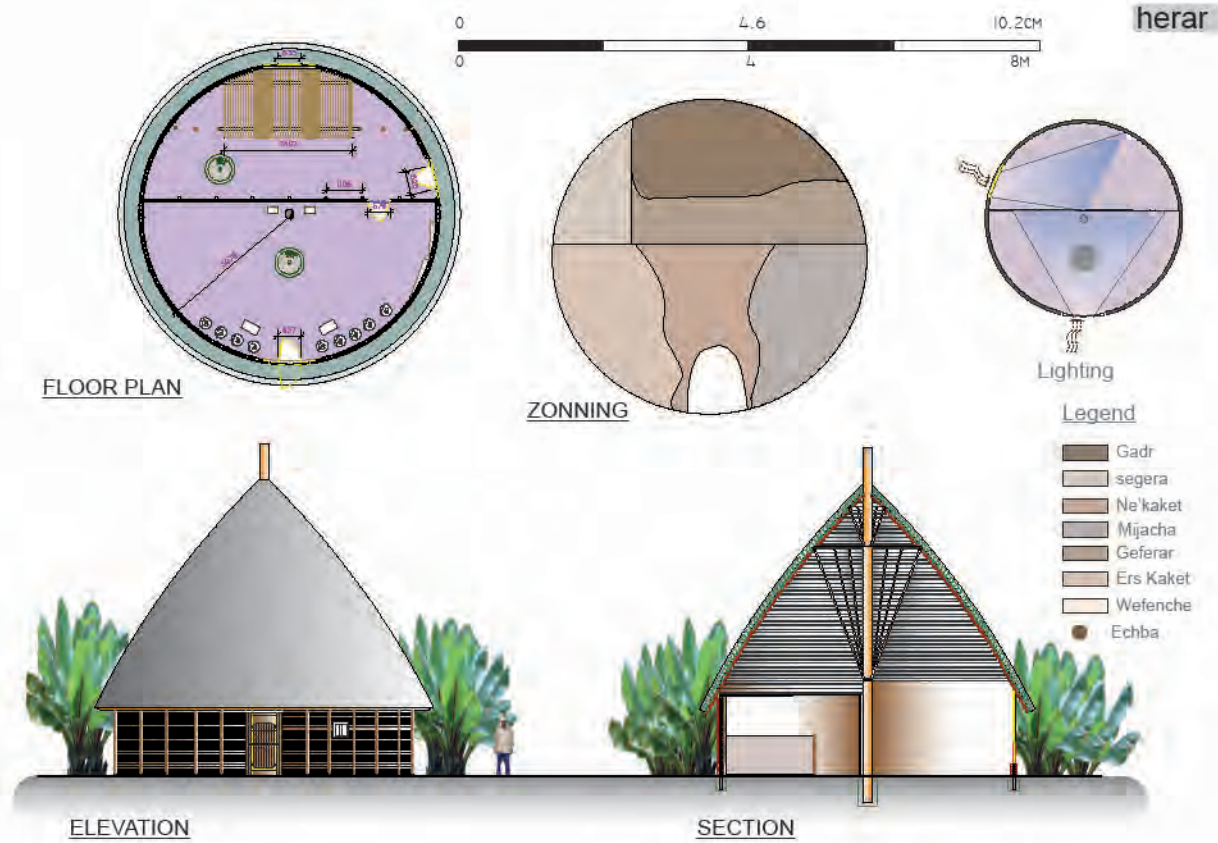


Figure 4.46.a. Graphical Analysis
of House unit 15

CASE 6
COMPOUND P

OWNER
Gebru Weldetensay

NO OF HOUSES 2
Front size of compound 57 m
Types of houses
Goye 1 & 2
Zeger 3
Herar 4



Compound: P

Gebru Weldetensay owns this compound with his mother. His parents gave him half *wedero* land to the right side of theirs. In this compound there are four house units, one old main house of his parent, one small main house of his, one guest house of rectangular CIS covered unit and one store and kitchen which is rectangular and covered with CIS. It is defined with fences and *enset* in addition to the house units. Their life is based on the farming production gained from their backyard. *enset*, vegetable, fruit, chat, coffee, wheat, sorghum, *teff* are produced in his backyard. He also produces honey, as the government is giving them training in this line. They use wood as a source of fuel for cooking and generating heat, they also buy kerosene from market for their light in the night time. They have latrine pit in their backyard. they use a river water for domestic activities and cleaning and pumped ground water for drinking purpose.

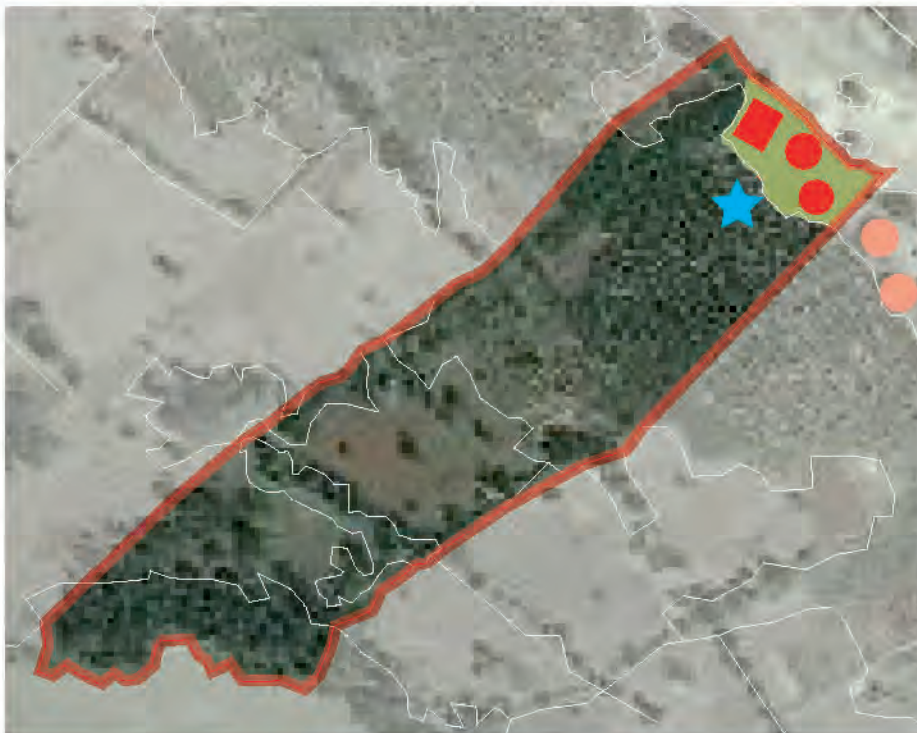


Figure 4.50 Site Plan of Compound P
(Google Earth + Overlay)

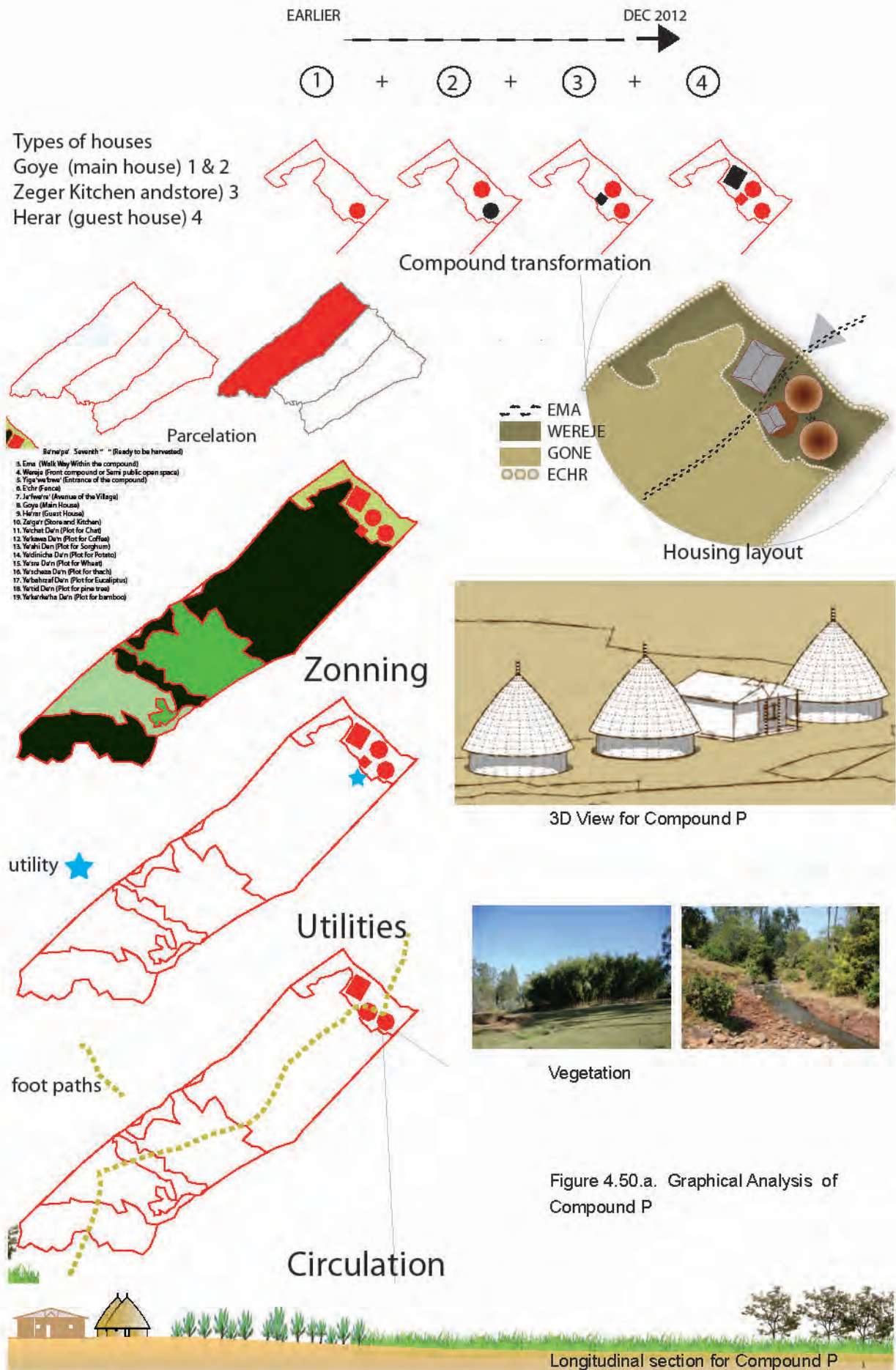


Figure 4.50.a. Graphical Analysis of Compound P

Case 6
Compound O
Owner Haile Fonziye

Number of houses 2
Front size of compound 70 m
Compound type 'private'



Compound: Q

It was three brothers who shared the three *wedero* land of their parent equally, of which Haile Fonziye is one of them. He is 71 years old and has six children but all of them are married and live in different towns. His life is based on agriculture and he produces mainly *enset* and vegetables in his back yard. In his compound he has two house units, the main and the guest house units which are both tukul which are circular shaped and covered with thatch roofing. His compound is weakly defined with fences. He uses river and ground water for his various purposes. Wood is the major source of fuel for cooking and heating and kerosene is also used to generate light during night times. He has latrine pit in his backyard for toilet purpose.

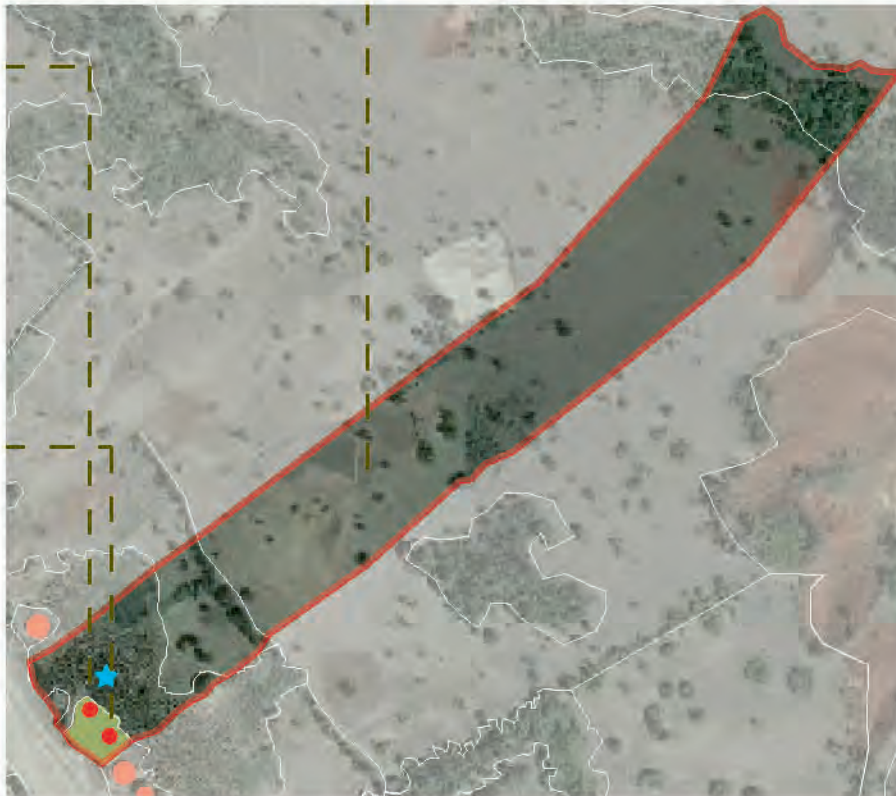


Figure 4.51. Site Plan of Compound Q (Google Earth + Overlay)

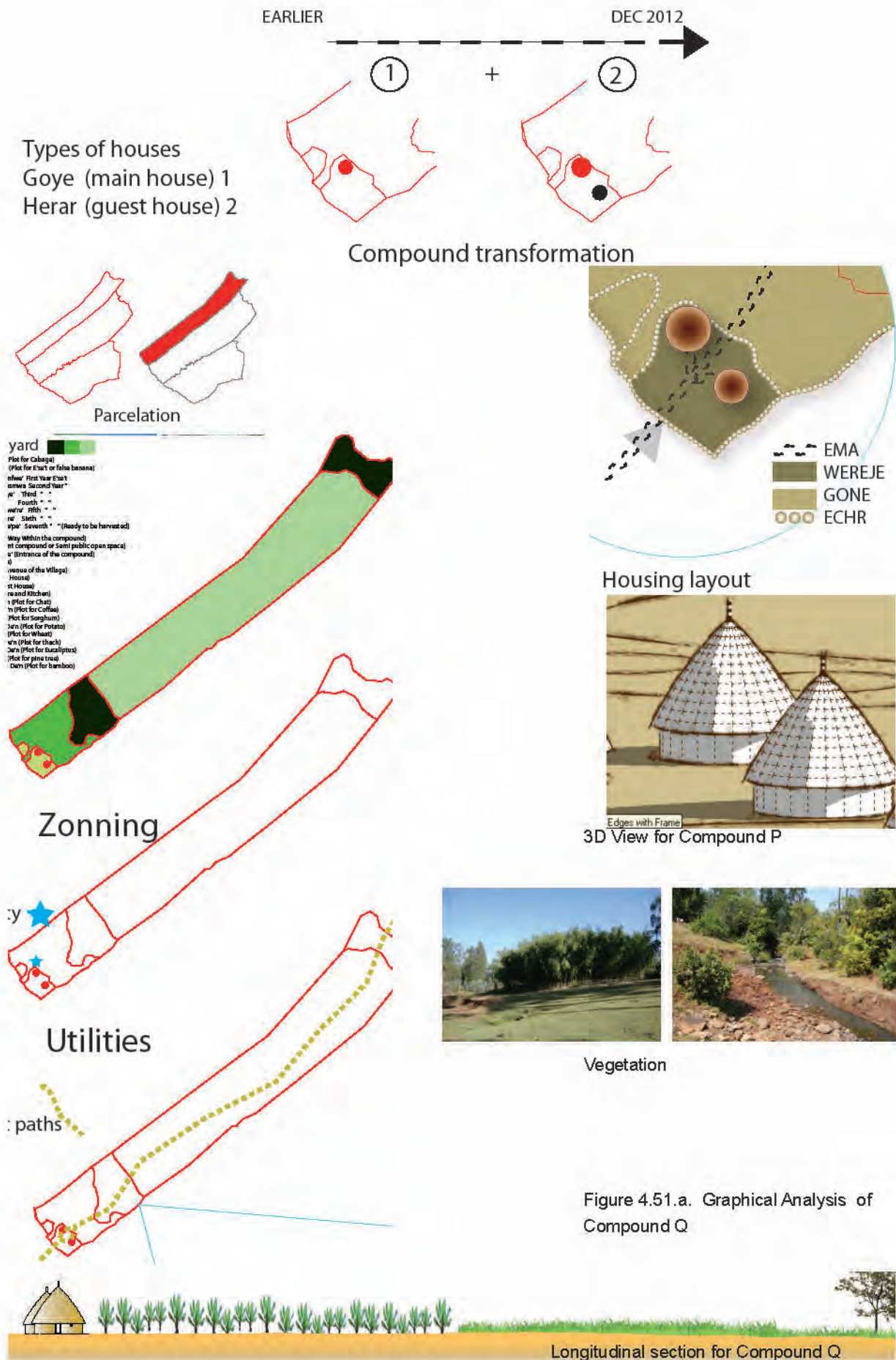


Figure 4.51.a. Graphical Analysis of Compound Q



House Units: 16

Kibebew Kifle's detail is given in compound 'R'. Basically he owns two units, one rectangular unit and one circular unit sharing same compound with his parents. The circular unit serves as a multipurpose, socializing space, sleeping space, cooking space, storage space and a barn space. The spaces are defined with a dominant central post and the radiating *wakas* or struts, a short wooden partition wall, a fire place at the front part and *nequotche* which is tying element of the cattle and supporting the *kote* above the *gadr* it has also a *segera* which serves as a shelf. It has a back and front yard doors for access. The rectangular unit is under construction on the stage of completion it is built to serve as a guest house. He builds this unit because he said there is a scarcity in thatch resource he also showed me his current house is maintained with the low quality style of thatching. His rectangular unit has metal framed door and window with glazing. He uses wood as a source of fuel for cooking and generating heat also for coffee ceremony. Kerosene should be bought from market place in town for the purpose of lighting during night time.

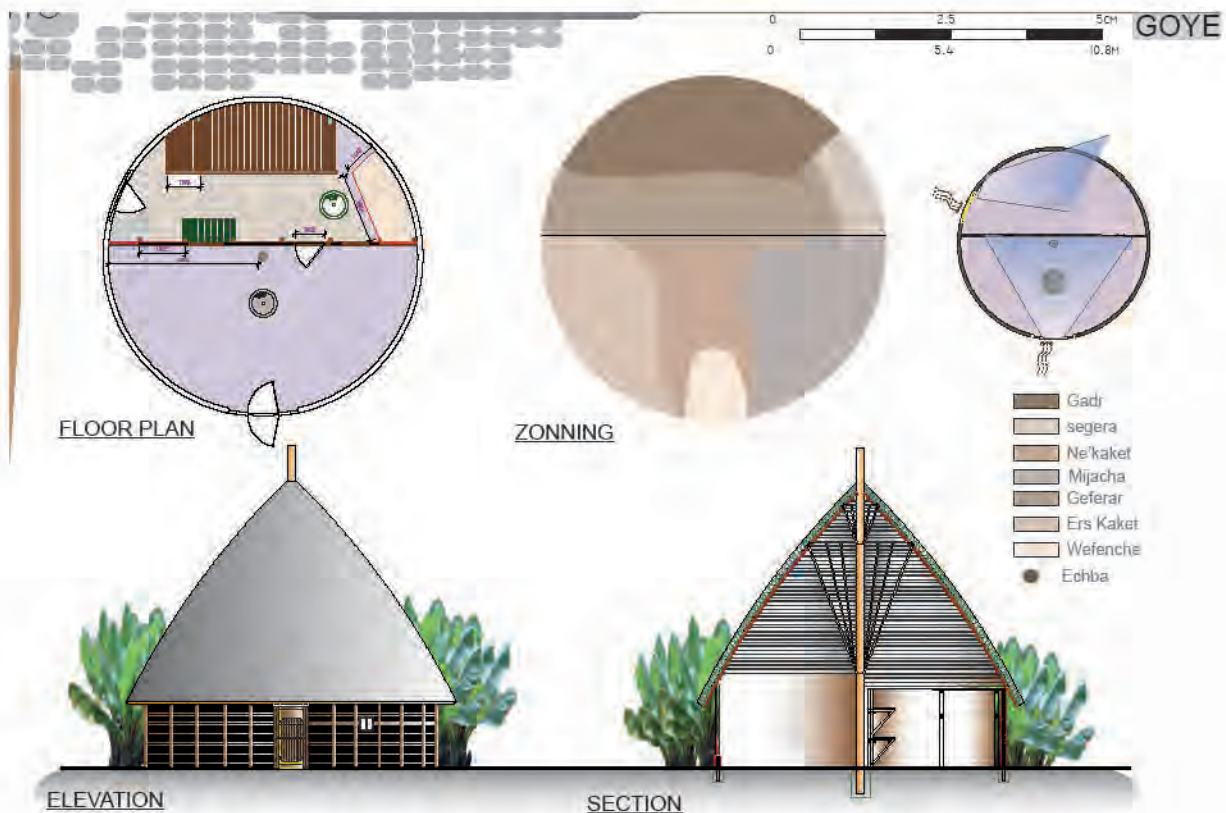


Figure 4.53. Graphical Analysis of House unit 16

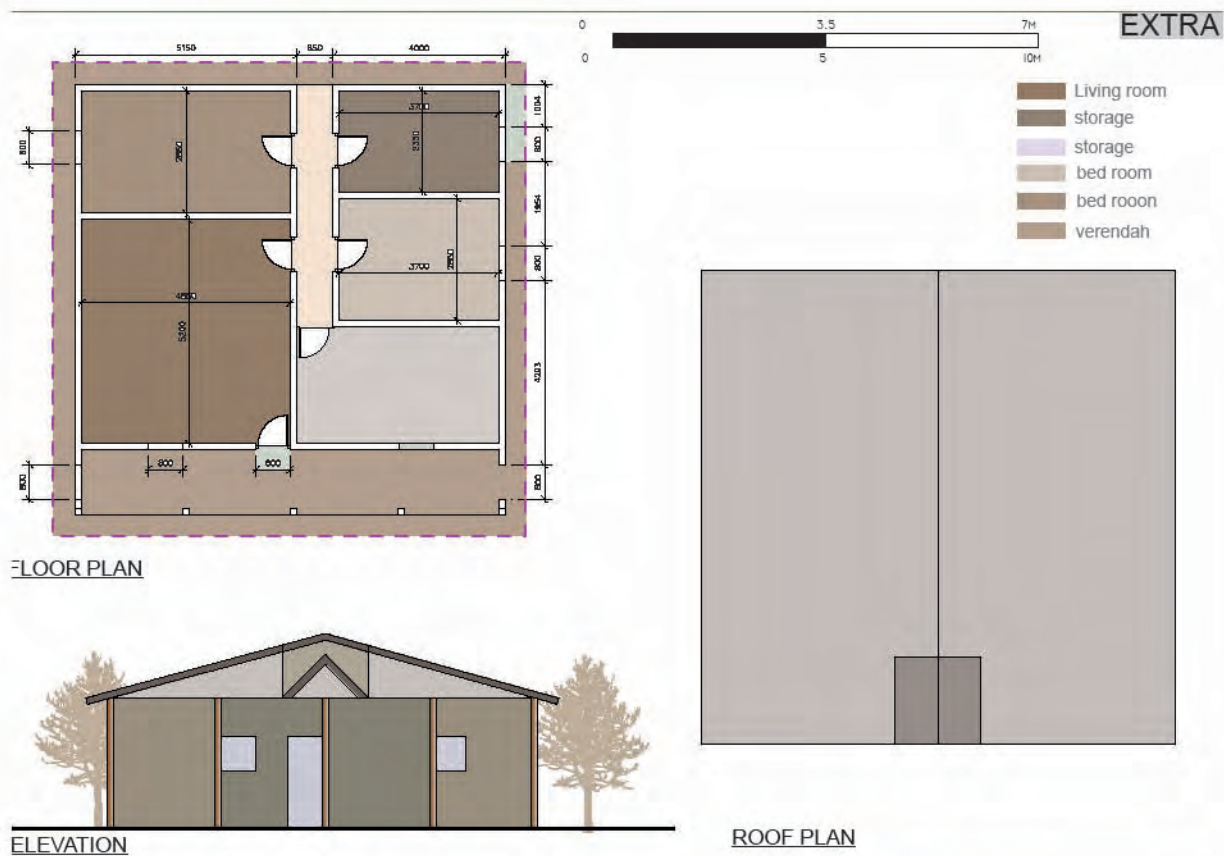


Figure 4.53.a. Graphical and Pictorial Analysis of House unit 16

House Units: 17



Ato Teka Atertr is 72 years old and have four children of which one of them is living near his compound having his own house built by his father Ato Teka Atertr. He owns three house units which are the main unit, the guest house unit and the kitchen and store all of which are tukul units. the main unit has an open layout which has immediately to the right side of the entrance there is the cattle space called *Gadr* continuing till the opposite wall of the entrance door. The *gadr* is supported with *Geferar* which is a circulation space. To the left side of the unit there is a multipurpose space to the front side which serves as a sleeping and socializing space. And to the back side there is a storage space called *derar*. Based on the items in the house storage spaces might vary as wall, *derar*, *kote* and the store house as he explained. At the center of this unit the central post and fire place which is used during coffee ceremony and whenever heat is needed in the space. The guest house unit is used as storage in the back side of the short partition wall called *agdata*. And used as a guest sleeping space whenever there is. The third unit is as they call it *Zeger* which functions as a kitchen and storage where kitchen elements are put. All units has only one door and no window. Fuel consumption and light sources are based on wood and kerosene respectively.

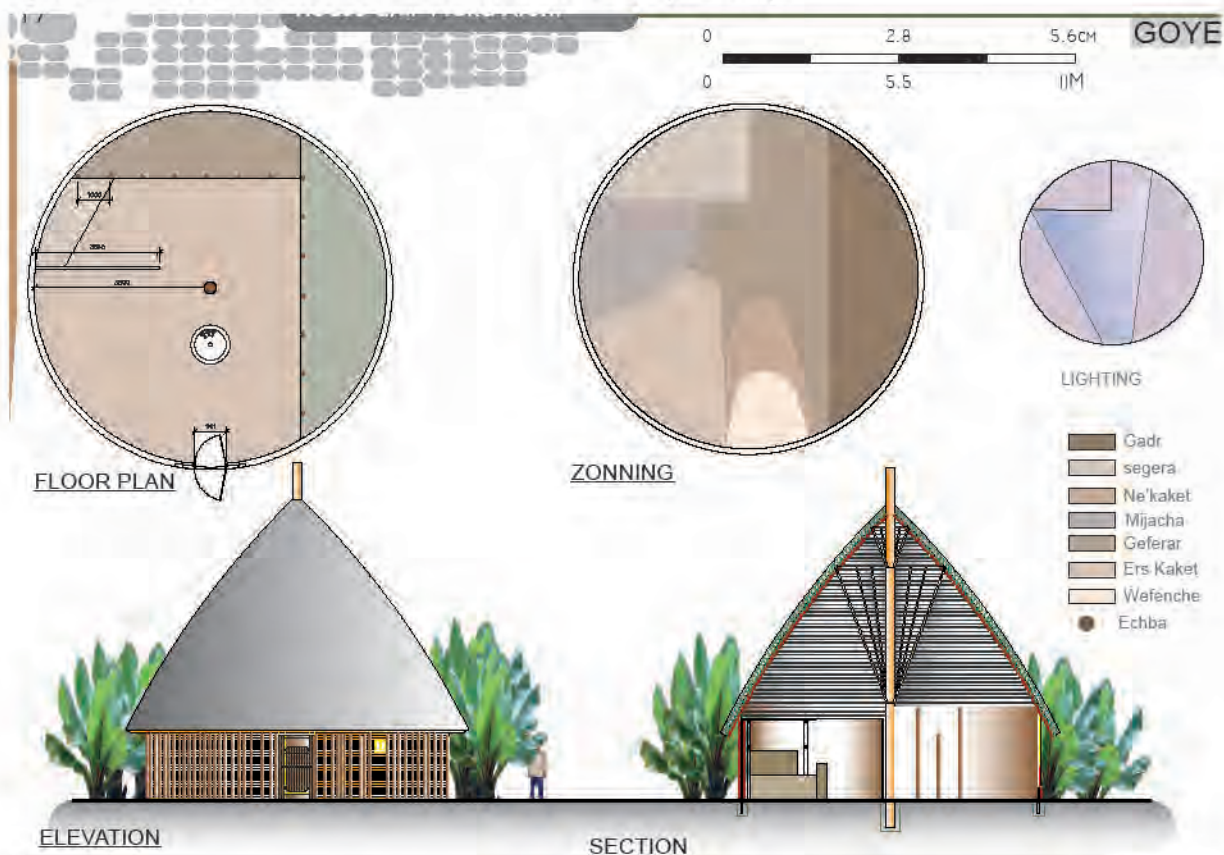


Figure 4.54. Graphical Analysis of House unit 17

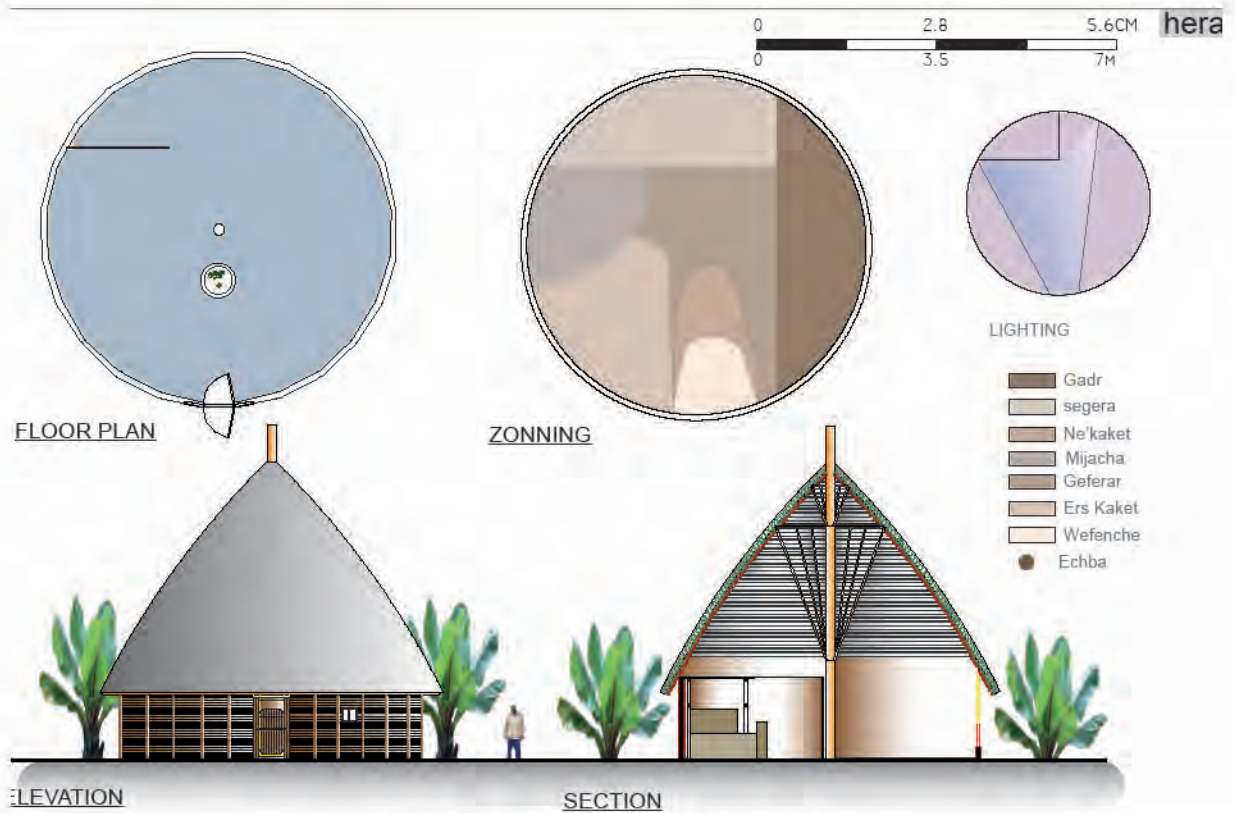
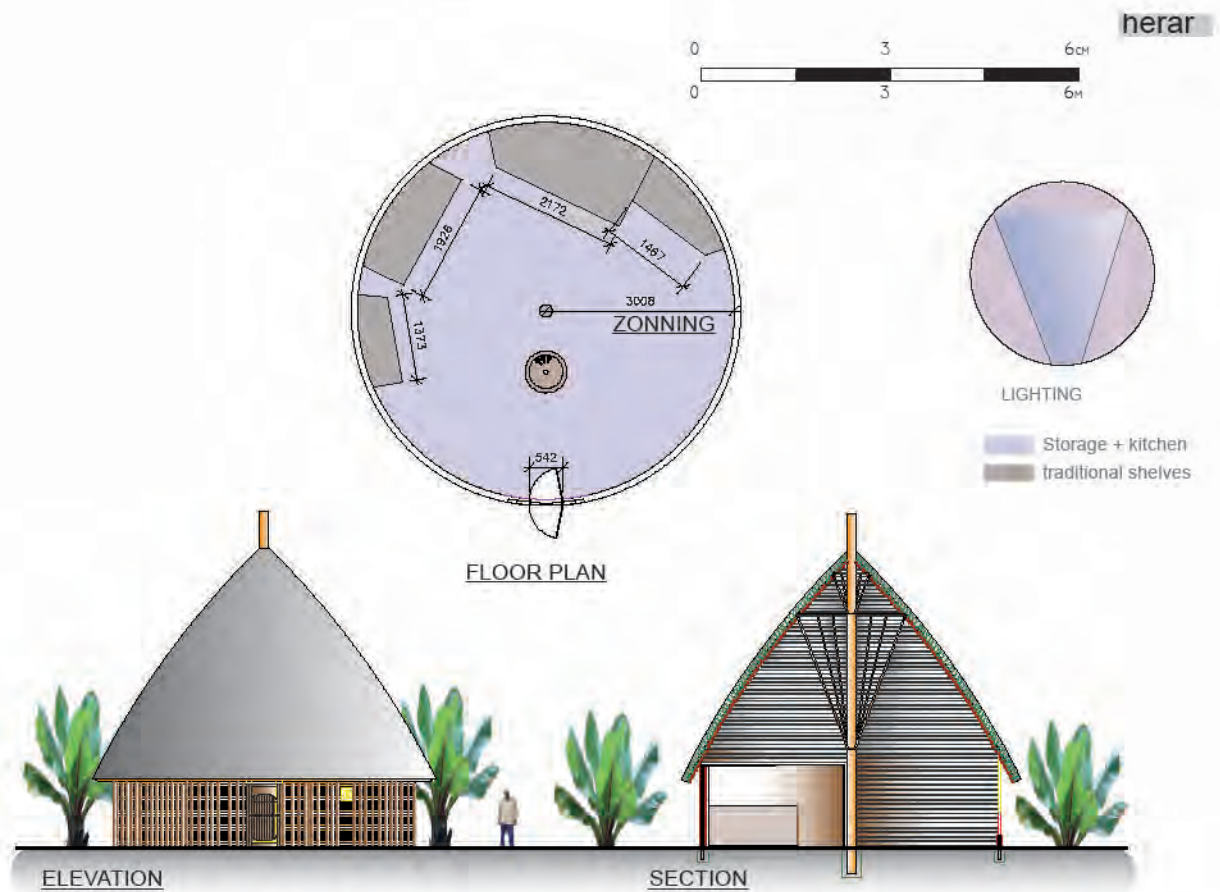


Figure 4.54.a. Graphical Analysis of House unit 17



Figure 4.54.b. Pictorial Analysis of House unit 17

Annex- B Questioners

Name _____ Age _____ Address _____

I. Family Information: Tribe _____ Clan _____ How long _____

A. Household structure

- | | | | | |
|----|--------------------------------|---------|-----------|---------|
| 1. | Head | a. Male | b. Female | c. Both |
| 2. | Children | a. Male | b. Female | c. Both |
| 3. | Extended Family | a. Male | b. Female | c. none |
| 4. | Children living in other towns | a. Male | b. Female | c. none |

B. Household Activities/ based on seasons

1. Labor division Activity time
- a) *Father* _____

- b) *Mother* _____

- c) *Children*
- (1) Male _____

- (2) Female _____

- d) *Extended family* _____

C. Domestic Animals

No .	Type	Number	Spatial position	Remark

II. Social Information

A. Historical Social Structure of the village

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B. Social Activities and their transformation (if they are)

1. Season of cultivation_____
2. Season of harvesting_____
3. Sharing of grazing routines_____
4. Loaning of cattle, grains and other food stuffs_____
5. Rendering services on occasion of birth_____
6. Mourning at death rituals_____
7. Participating in village politics_____
8. Informal gathering (Edir, Equb)_____
9. Participation in Tukul construction (Debo)_____
10. Others_____

III. Cultural Information

A. Cultural activities

1. Ritual_____ space allocation_____
2. Events_____ space allocation _____
3. Others_____ space allocation _____

B. Religion_____

1. Spiritual gratitude_____
2. Space Provision_____

IV. Economic Information

A. Income Generation Mechanisms

1. Agriculture_____
 - a) *Farming*_____, *What*_____
 - b) *Animal Husbandry*_____
 - c) *Selling price in local market*_____
2. Farming tools selling/purchasing_____
3. Help from children in other towns_____
4. Other sources of income_____

B. Monthly Expenditure

1. Food stuffs /purchased_____
2. Kind of mill (seasonal)for:
 - a) *Breakfast*_____
 - b) *Lunch*_____
 - c) *Dinner*_____
3. Fuel :
 - a) *Baking*_____
 - b) *Heating*_____
 - c) *Lighting*_____

V. Spatial Data

A. Type of house unit they have and the reason behind

1. Vernacular
2. Modern (*korkoro bet*)
3. Both
4. Do they aspire to have the other type? _____ why?

B. How many units are there with in a compound

1. Tukul
A, one b, two c, three d, four e, above
2. 'Korkoro bet'
A, one b, two c, three d, four e, above

C. How did they manage to have these much units?

1. How? _____
2. For how long? _____

D. How many rooms/spaces do each unit has? Name and purpose of each room and space? Cultural value and meaning?

1. Tukul _____
2. 'Korkoro bet' _____

E. Size and proportion of the house units

Village		
Compound	Units	
	Tukul	'Korkoro bet'

F. What is the average size of a compound?

1. How did they decide the size _____
2. Who is responsible for plot division _____

G. Daily activities based on spatial usage and time? Ordinary/weekends/event/seasonal/

1. Morning
2. Afternoon

3. Evening

4. Night

H. Did the space transformed from its original and historical appearance? At unit, compound, and village settlement level?

1. If no why? _____

2. If yes how and why? _____

I. Which type of the house unit is comfortable? Favorite _____
Why? _____

_____ which space _____ why? _____

- J. Does the room incorporate proper: If not why?**
1. Light?
 2. Ventilation?
 3. Sanitation?
 4. Water supply?
- K. Which element of the *gurage* house identify the culture? And how?**
-
-
- L. How does the position of a specific space decided? And why?**
-
-
- M. What is their feeling and preference on the idea of spatial privacy?**
1. Private space
 2. Semi private
 3. Public
- N. How do they segregate their spaces? What are the defining elements?**
- O. Why is the roof so high?**

VI. Construction Data

1. What are the steps and process of construction in both typologies?

2. How long does it take to complete the construction process in both cases?

B. What are the building materials used in both cases

C. How much does it cost?

D. Who participate in the construction process?

E. What are the construction techniques applied in both cases?

--	--

F. Are there any transformations on: if yes why?

1. The process
2. Technique
3. Material

G. How is the availability of materials in terms of :

1. Distance
2. Time
3. Cost
4. Climate change

H. How is the availability of skilled labor? And how is the contractual agreement?

I. Which typology is easier and cheaper to build? Why?

VII. Environmental Data

A. Water (based on the purpose)

1. Where is it fetched from _____
2. By whom _____
 - a) *In what* _____
3. How many times a day? _____

B. Cleaning:

1. How is the house and the village cleaned? _____
2. How often _____
3. Where are the clothes washed? _____

C. How wastes are disposed of (managed) ?

1. Human waste: _____
2. Animal waste: _____
 - a) *If stored, where ?* _____
3. Kitchen and household garbage: _____

D. Energy

1. Cow dung _____
2. Solar _____
3. Electricity _____
4. Others _____

E. Storage

1. What is stored? _____
2. Where? _____
3. How much? _____
4. What will it be used for? _____
5. How often is the store refilled _____

F. Do you have a problem in the summer or winter time to stay comfortably in the house? If yes Why? _____

G. Is there any problem you have faced in everyday life in your house? If yes what? _____

VIII. Utilities (Infrastructure)

- A. Road
- B. Electricity
- C. Telephone
- D. Water supply
- E. Health facilities
- F. Religious centers
- G. Schools
- H. Cemetery
- I. Mill house

IX. Thought

1. What is modernity and modern house?
2. How is the acceptance of privacy in *gurage* culture?