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Gamo Society Vernacular House Typologies and Their Science, Southern Ethiopia

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Abstract

The main purpose in this study is to identifying house typology & their science in Gamo society, southern Ethiopia. It provides facts about the vernacular houses of the society. Types are identified without looking in to architectural detail, ornament, building materials and construction techniques. In determining house typologies, generally only the core or main part of the house is considered; small side wings, rear service (or extensions) later additions, and attached outbuildings usually are not taken in to account. A case study which is supplemented with a qualitative research method was conducted from Nov./2012-Jan./2013. The case study was done in one year by taking 57 sample vernacular house typologies from 42 Deres/communities/. Data were collected using qualitative methods, Capturing images, videos and as well as observation. After clearing and checking for consistency data was grouped, edited, coded and analyzed.The result shows in Gamo society three major vernacular house typologies; Waje, Kara and Yara, were identified based on their shape, function, method of construction and construction material they used. And the result of this study showed that Gamo society is inter-related with their vernacular houses.

Keywords: Society;Vernacular; Gamo; Waje; Kara and Yara

1. Introduction

Ethiopia officially known as the Federal Democratic Republic of Ethiopia, is a country located in the, Horn of Africa. It is bordered by Eritrea in the north, Djibouti and Somalia in the east, Sudan and South Sudan in the west, and Kenya in the south. With its capital at Addis Ababa, it is also the most populous landlocked nation in the world. Ethiopia is a composite of more than 80 ethnic groups.

These ethnic groups have their own indigenous cultural identities based on their pre-history. Each group tends to have some slight cultural difference even from its nearest neighbors. In different societies they have their own

indigenous cultural identities based on their pre-history; martial ceremony, death ceremony, different festivals, housings etcamong these differences housing or building style which the research focused on.

Building simply indicates anything that encloses space on some scale sufficient for human being to move in [1]. People have constructed buildings and other structures since prehistory, including bridges, amphitheaters, dams, electricity pylons, roads and canals [1].

Architecture is both the process and product of planning, design and construction. Architectural works, in the material form of buildings, are often perceived as cultural symbols and as work of art. Historical civilizations are often identified with their surviving architectural achievements. Architecture is a medium of cultural expiration displayed using a specific set of principles. These principals are meant to be interpreted so that the culture of a period or nation can be fully expressed and understood [2].

Vernacular architecture is a category of architecture based on localized needs and construction and reflecting local traditions. Vernacular architecture tends to evolve (any kind of gradual change) over time to reflect the environment, culture, technological, and historical in which it exists. It has often been dismissed as crude unrefined, but also has proponents who highlight its importance in current design [2].

Vernacular architecture is not high-style design created by professional architects and based on academic or theoretical principles. Rather, it is the skill of traditional building construction passed from one generation to builders to the next in a practical hand-on way through the use of materials, form, and ornamentation [2].

Traditional buildings are disappearing in many cultures and societies. Few traditional houses have been maintained in their original condition to present. Most houses, especially those owned by local residents were transformed from a common archetype to accommodate modern ways of living. Those changes can bring about both advantages and drawbacks. One advantage is protecting the extending the life of traditional houses; the process of ownership and stewardship add to building's survival.

2. Statement of the problem

Disappearing of vernacular houses is also a common problem of the entire world including developing countries. This is because Vernacular architecture is influenced by a great range of different aspects of human behavior and environment. Thus, leading to various building forms for almost every different context; even neighboring villages may have subtly different approaches to the construction and use of their dwellings. Despite these variations, every building is subject to the same laws of physics, and hence will demonstrate significant similarities in structural forms.

The disappearance of vernacular houses can be manifested in different social life. If this situation continued in such a way, it has its own impact on the environment, plant cultivation, and animal production. In addition, if there is no intervention to solve this phenomenon, there may be challenges

to the survival of the society's culture as well as change in the ecosystem which can in turn complicate the situation.

3. Methodology

a) Case-study

The case study was focused on Gamo society, Southern Ethiopia. GAMO *(Kodo, Zhadha, Doko, Boreda, Dorze, Ocholo, Shaara, Shaama, Wobera, Doqama, Andro, Dita, Wusamo, Tsayte, Zigiti, Gantta, Gatse, Garbantha, Algude, Kale, Bonke, Zame, Kama'ale, Gerethe, Zargula, Manana, Ele, Dara, Guge, Dingamo, Haringa, Malo, Shela, Anko, Coye, Otolo, Kamba, Haniqa, Balta, Garda, Qucca Qogota(Ezo,Chencha,Sul'a)*

Included sections in research study procedures are;

1. ***Field procedures (access to sites)***

- Make contact with Zone culture and Tourism communication Departments.
- Make contact with "*Woreda*" culture and Tourism communication Departments.

2. Designed procedures were involved for data collection

- Interviews
- Capturing images and video
- As well as observation.

3. Questions (specific questions that the investigator must keep in mind during data collection)

- What types of housing construction materials used?
- What types of the shape, functions and others of *Gamo* housing design have?
- How they are constructing their house (tools and techniques)?
- What are the relations of indigenous house construction with modern architecture?
- What are their methods of preserving their vernacular houses?

b) Study data collection tools

The study tool will be a photo camera, video camera; interview administered structured and unstructured interview as well as observation. The selection of household for interview will be taken by random selection method based by observation of the house design style and with help of Culture and Tourism Communication Departments. If there is no adult member of the household the interviewer moved to the next household.

The questionnaire has two parts: The first part assess the socio demographic characteristics of the respondent. The second part of the questionnaire deal with the knowledge and perception about the vernacular house.

The findings that will be explored by both qualitative and quantitative data open ended, closed ended, questionnaires, interview, video camera, photo camera and observation will be used to collect and analyze the raw data.

c) Description of the study area

Gamo is the name of the Ethiopian ethnic group who speak the *'Gaammoththo'/ Gamo language*[3, 4, 5]. The area found in Gamo Gofa zone of Southern, Ethiopia lies somewhat 500 k.m south of Addis Ababa (capital city of Ethiopia) and 200 k.m north of the Kenya border. The topography of the land characterizes an undulating feature that favors for the existence of different climatic zones in the area. Astronomically, the area is located from $5^0$57"to 6^0 71" North latitude and $36^0$37" to $37^0$37" East longitude, with a total land area of 7366.59km$^{2.}$ [3].

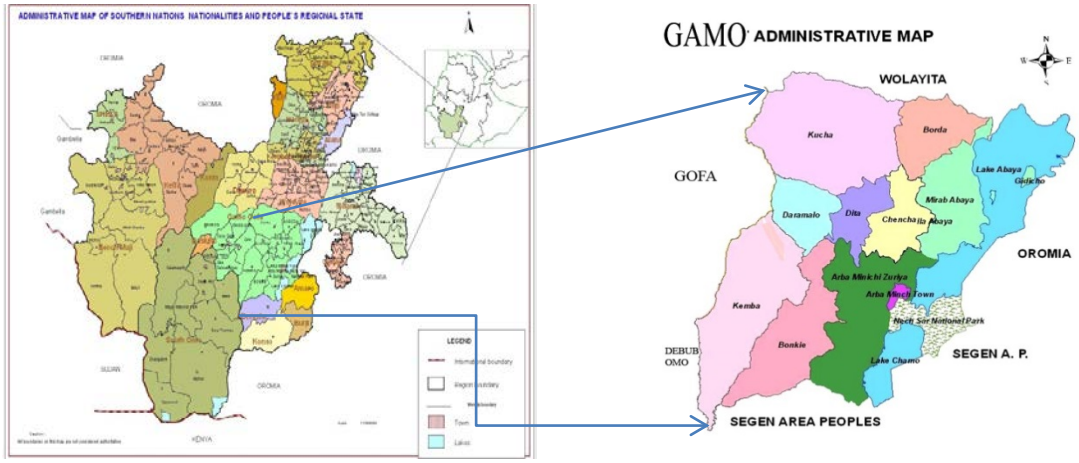
The 2007 Ethiopian national census reported that 1,107,163 people (or 1.5% of the population) identified themselves as *Gamos*, of whom 141,233 were urban inhabitants[6].*Arba Minch (Garo)* town is the administrative and trading center of the society, located at 505 km from Addis Ababa and 275 km south west of Awassa [3,4].

The community comprises of nine present political units (woreda) they are, Arbaminch zuria, Bonke, Boreda, chencha, Daramalo, Dita, Kamba, Kucha and MirabAbaya .It is bordered to the north and north west by Wolaita and Daworo zones, to the south by South Omo zone and Derashe special woreda, to the east by Gedeo zone and Amaro special woreda and to the west and south west by Goffa community[3]. In Gamo society, group identified as sub communities locally called *"Deres"* corresponding to distinct dialects. There are about 42 *"Deres"* and one *"Dere"* can be easily identified by his /her speech. These *"Deres"* had similar but autonomous political structures of their own for a very long period of time. They fought series of wars against one another for dominance [5].

d. Settlement of the people Until the first half of the 20th century, the distribution of the Gamo people was limited to the highland area. This was because the lowlands were very hot and people easily caught deadly diseases like malaria. Later when they saw that these lowlands were fertile and through irrigation could yield better products, peoples started to settle in low lands/ at present, the low land also have better transport access and other social services than in the high lands. So, lowland areas where irrigation is possible are setting more and more crowded today.

e. Social value

When we see the social value with in relation to vernacular house on the time of martial ceremony majority of them are constructing new small house on the compound of the son father the so called ‘Dume’/mishira ketha/. After the son developing his own asset, he is constructing new house and shift the station from father house. Finally he is going to participate in different social case as representative of his own house compound.



Figureure1-a: 111Reginal Map of SNNPR[7]Figure1-b: Adminstrstive Map of Gamo[7]

Table-1-Population Statistics of Gamo weredas Summary and Report of the 2007

Wereda	Urban + Rural			Urban			Rural		
	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female
Kucha-	149,835	74,482	75,353	5,727	2,939	2,788	144,108	71,543	72,565
Boreda-	67,947	34,453	33,494	2,761	1,459	1,302	65,186	32,994	32,192
Merab Abaya	74,901	37,395	37,506	5,831	2,928	2,903	69,070	34,467	34,603
Arba Minch Zuriya-	165,680	82,751	82,929	-	-	-	165,680	82,751	82,929
Chencha-	111,680	51,307	60,373	13,301	6,556	6,745	98,379	44,751	53,628
Dita	83,953	39,449	44,504	2,971	1,380	1,591	80,982	38,069	42,913
Deramalo	80,999	41,607	39,392	3,220	1,741	1,479	77,779	39,866	37,913
Kemba-	155,748	79,125	76,623	5,612	2,776	2,836	150,136	76,349	73,787
Bonke-	158,795	78,961	79,834	6,344	3,119	3,225	152,451	75,842	76,609
Arba Minch /Town/-	74,843	39,192	35,651	74,843	39,192	35,651	-	-	-

Source: - *Summary and Statistical Report of the 2007 Ethiopian Housing Census Results, December 2008, Addis Ababa.*

3. Result and discussion

3.1. Introduction

The main objective of this case study was to identify vernacular house typology and their science in *Gamo* society, Southern Ethiopia. The research methodology has been presented above.

Based on data collection the result that shows most of the typology is identified in different criteria that are with the aspect of shape, function, and material they used to construct.

Tools which are used to study are: - photo and video camera, structured and unstructured interview as well as observation. The selection of household for interview was taken by random selection method based by observation of the house design style and with help of Culture and Truism Communication Departments. If there is no adult member of the household the interviewer moved to the next household.

The socio demographic characteristics of the respondent, structured interview Characteristics of the respondents and unstructured interview Characteristics of the respondents will be presented as following:

3.2. Socio demographic Characteristics of the respondents

Respondents were asked to indicate various aspects relative to their social history, sex, Age, Marital States, Education level, Source of income, income per month, Ethnic group, Clan, Religious, Sub- Community, specific sub-community.

- .A total of 42 *Deres* sample were covered with a response rate of 100% of which over 85.96%,
- were highland. The mean age of the respondent was range 25 to 108 years. The dominant age group was 30 to 65 years accounting to 50/ 57 of the study participants.
- Respondents were asked sex to identify owner ship and from this respondents 92.98% male accounting to 53/54%.
- Respondents were asked marital status to identify who is taking care of the house and from this respondents 100% married accounting to 57/57.
- Respondents were asked Education level to identify their modern engineering skill and from these respondents 100% below Junior school level to 57/57.
- Respondents were asked Source of income and household incomes per month to identify how they care for the house and from this respondent's 100% self-employed accounting to 57/57. And an average monthly income is from 500 to 1000 Eth. Birr
- Respondents whom were asked to identify their belong Ethnic origin, clan, sub- community, specific sub- community / *Kebele* are requested to be 100% of *Gamo* Ethnic group accounting to 57/57

3.3. Structured interview Characteristics of the respondents

1. Feeling on ongoing vernacular houses.1% is dissatisfied and others 99% are satisfied.
2. Response in need of necessary modification on ongoing vernacular houses. 100% Agree
3. House owner ship 100% by them selve.

3.4. Unstructured interview Characteristics of the respondents

3.4.1. Types of Gamo vernacular house

There are three main types of Gamo vernacular houses which are used to live in different communities. These are Waje, Yara and Kara. When we see within different communities, there is slight difference. According to the society, houses are differing in their shape, sizes, functions, way of construction and material used to construct.

3.4.1.1. Waje/ Zuufa

"*Waje*" is type of *Gamo* cultural house and it is composed of two elements. These are roofing and wall. Also there are several types of *waje* regarding to their function. They vary in slight shape, size, material used, and method of construction. For example the community identifies "*Waje"* based on their number of central post. *Wage* house has more than one central post and this central posts support the central horizontal membrane which is called" *Zuufa*". The amount of posts show that the capital /economic level of the owner.

It also varies in materials used to cover. This means they use to construct: bamboo and barley /wheat steam in very hill area and grass and available woods in medium lowlands.

Figure-2. A- External view of "*Waje*" type house from; *kamba, Dara, Bonke* communities respectively / This type of design is communal in *Kamba, Dara malo, kucha, bonke* woredas/

Figure-2. B- Internal view of "*Waje*" type house; the 1st threes from *Kamba* and the last from *Bonke* communities respectively.

Figure-2.C- Structural view of *Waaje* type house /from *bonke* and *kucha* woredas respectively/

3.4.1.2. Yara

"*Yara"* is a type of *Gamo* cultural house and it has one element; the so called wall. It also vary in shape, size and materials used to cover. For example, in highland areas whole part of the body is made of bamboo product and others use in semi lowlands Grass and steam of barley*/buxxa/* for the roof cover.

Figure-3.A- Exterior view of "*Yara*" type house from; *Dita, Dorze, Doko, Ezo* communities respectively

/ This type of design is communal in *Chencha, Dita,* woredas/

Figure-3.B- Interior view of "*Yara*" type house /pictures from; *Dita,,Dorze, Doko, Ezo* communities

3***.4.1.3. Kaara***

"*Kaara*"(*Elfine,Embare,Delle, Goda keeththa*) is type of *Gamo* cultural houses and it is composed of two structural elements. These are roofing and wall. These are varying in shape, Size materials used, and method of construction.

Figure-3.C- Structural view of "*Yara*" type house

Figure-4.A- Exterior view of "*Kaara*" type house from; *Dara, Boreda, kucha* communities respectively / This type of design is communal in *Dara Malo,Boreda, Kucha ,Dita lowland* woredas/

Figure-4.A- Exterior view of "*Kaara*" type house from; *gerese-bula, zigit* communities respectively / This type of design is communal in *Dara Malo, Dita, Arbaminch zuria, Chencha, kamba, Bonke* woredas

3.4.2. Construction materials

In *Gamo* society there are different types of house designs. Different indigenous materials are used to construct and the most important popular material is from bamboo plant. Most of the people are using bamboo for structure, roof and its stem cover for roof covering. Others using different trees and bamboo stem as structure and grass and bamboo steam cover for roof covering. Therefore, bamboo plant/ *wooyshsha*/, different trees

/*miththa*/, grass, barley and wheat steam/ *buuxa*/, bamboo steam cover / *qada*/, ropes */wodoro/surssa/ tuurra/* and mad are raw vernacular houses construct ruction material for *Gamo* society.

Figure-4.A- Exterior view of "*Kaara*" type house from*; Kamba malo, Ezo, shara* communities respectively / This type of design is communal in both lowlands and high lands of *Gamo woredas*/

Figure-4.B- Interior view of "*Kaara*" type house /pictures from; *Shara and Boreda* communities /

Figure-4.C- Structural view of "*Kaara*" type house

3.4.3. Construction tools

Figure-5- Beexxe *Figure-6- Qoyxee* *Figure-7- Baacca* *Figure-8- Mashsha*

Figure-9- (Pike) *Xoylle* Figure-10- *Kaltta* Figure-11-*Akaffa* (shovel) Figure-12- *Yangara*(lader)

Figure -13-. *Yara/shocha/qotha* type of house skeleton

Technical terms

1. ***Lasha***: - is the constructed bamboo after *'loshe'* and it is two in number.

2. ***Gutto***: - Is the top cape which is found over the roof.

3. ***Loshe***: - Is the first layer of the construction which is from a single bamboo and used to strengthen the structure.

4. ***Kaara***: - is the top of the house and which used to connect the tip with the raising wall.

5. ***Gatta***:- is a grass type used to cover the roof structure of the house.

6. ***Buuxxa***:- is the steam from wheat or barely which is used to cover the house body.

7. ***Daddaha:-*** is the process of tying *gata* or *buxa* with the house structure.

8. ***Xephphe***:- is tied of the grass which is thrown ones from the ground to constructor over the house.

9. ***Qada***: - is the cover part of bamboo steam. And which is used as covering material.

10. ***Shoolle***: - is the smoothed bamboo by using the instrument knife/mashsha/, /kalta/.

11. ***Qisse:-*** is quarter of the bamboo, used as strengthening the structure. And which is turning its back to inside and being beside of the Ade.

12. ***Finice***: - is the tied stick used as strengthening and it helps to add another stick to the roof.

13. ***Phekkele***: - is the junction of wall and the roof.

14. ***Sharpe***: - is the frame for the door.

15. ***Zala***: - is a level for constructors. It helps to stand on it and to construct the next part.

16. ***Zoono***:- is found on the front part of the get. And it acts as waiting room

17. ***Meega***: - is the stick like structure which is used to connect the cover and the house structure.
18. ***Kama***: - is the process of grassing the house.
19. ***Haththa pappo***: - is a process of spring water to the *qada* to make flexible. Also it protects from breaking.
20. ***Shartto Keesso***: - is the way of removing the lap of the bamboo steam.
21. ***Siiqe***: - is the stick instrument which is used as nail to attach the cover and mega with the house structure.
22. ***Adde***: - is the half of the bamboo and which is strengthening the structure. And which is turning its backto outside and being medium for the two *qise's.*
23. ***Garbale***: - is the huge *yara* house.
24. ***Gocciilla***: - is ground line structure on the get.

3.4.3. Defects and Preferable solutions which are adapted in Gamo society

There are different types of defects on the modern and vernacular houses. These defects can be caused before or after construction. Some of those are: rain shading, Weevils, Decay, Termites /*kuysa* /etc.

The society can solve these problems by using their own mechanism before and after construction. The following are the problems and their prevention mechanisms:-

1. Rain shading

Rain shading is defect on the houses which is caused by rain drop, and decays the structure of constructed houses. In this case, they take care for little shading by covering the specific place and if the drop covers wide place they re-cover the whole body.

2. Weevils /tstsonththa/

Weevils are types of beetle which destroy crops and bamboo trees. Which are caused decay the structure of constructed house. Therefore, to solve these problems the society can use two mechanisms. Those are taken before and after construction. When we say before construction, they use to cut the bamboo plant by looking the moon shines on the first four days of the year and after construction, they use to smoke different leaves of the smoking trees by mixing chilly for six hours in a day. This action takes place at least for month.

3. Termites /kuyysa/

Termites are a small white tropical insect which eats, decay the wood and stores the soil on the ground. Also it damages the physical grace of the house. The society can prevent these types of defects in two ways, thus are the former and lateral. They know that this problem is usual case, so that they take care by leaving slights gap between the ground and the covering grass. The next is they use to dig out the queen, when they see the stores of the soil near to their house.

4. For decay of structure caused because of long time service

Decay of the wall structure is caused because of long time service of the house after construction. These types of problem are solved by repairing. The process is done by mixing new bamboo with the old one and cutting all around decayed parts of the grounded and then after re-plant on the ground.

3.4.4. General overview of design

a) Concept

For *"Yara"* type house = Elephant

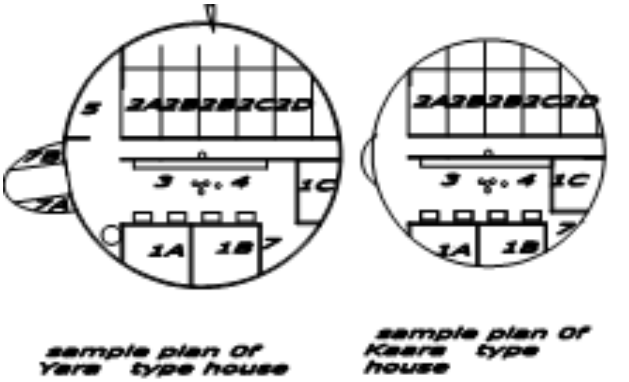
For *"Kaara"* type house = Mother

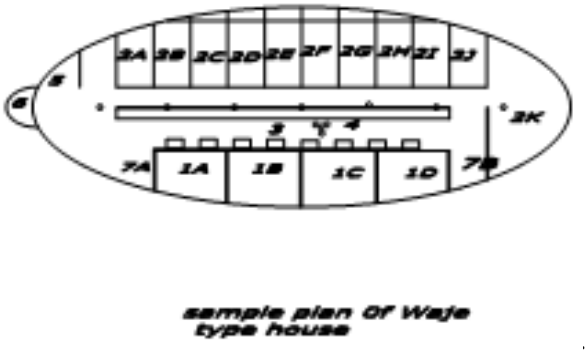
For *"Zuufa "*type house = lion

b) Program

1. Bed areas
2. Livestock shelters
3. Living and Dining places
4. Cooking places
5. Livestock feed store places
6. Waiting place
7. Store area
8. Agale/shako/ upper special store

c) Sample plan designs





3.4.5. Method of construction

The construction methods for these typologies are mentioned as bellow:-

***Yara*: -** The construction method is starting from leveling and there are slight deference mentioned as follow, the first step to construct this type of house is site leveling. Then, based on the owner interest they form circle with given radius. The next step is planting "*Qise*" and "*Adde*" by following the circle circumference. And then

they start waving to get "*lasha*" and preparing landing after 90cm height to constructing the next part. Finally to cover the tip they use to wave another small cape and they start covering by using *"Qata"/"Gata"/"Buuxa*".

***Kaara*: -** The construction method is starting from leveling and there are slight deference mentioned as follow, the house is constructed with combination of two elements "*kaara*"/roof/ and *goda*/wall/.To construct this type of house same step is taken like Yara. Then, based on the owner interest they form circle with given radius. The next step is constructing the first element which is wall body by following the circle circumference and by covering it with mud and others. The third step is they construct the roofing /*kaara/* in separate. Finally they put the *kara* over the wall and cover it by using *"Qada"/"Gaata"/"Buuxa*".

***Zuufa*: -** The construction method is starting from leveling and there are slight deference mentioned as follow, the house is constructed with combination of two elements "kaara"/roof/ and goda/wall/.To construct this type of house same step is taken like Yara and kara. Then, based on the owner capital and interest they decide the number of central post and they form the elliptical shape. The next step is constructing the first element which is wall body by following the circumference of the ellpice and by covering it with mud and others. The third step is they construct the roofing /kaara/ in separate. The third step is they construct the roofing /kara/ over the wall with side to side and finally cover the external by using *" Gaata"/"Buuxa*".

3.5. Economical contribution of Domestic animals and abundant plants and their relation with vernacular houses

When we see the economic income of *Gamo* people majority of them are living by agriculture. Traditional livelihood strategies are based on maximizing the value of biodiversity to increase security and to buffer shocks. They involved in two types of farming activities. These are home garden and outpost farms.

"Utha" plant is the first and highly consumable food type in *Gamo* highland communities while; banana and maize are common in the lowland. This plant has potential to resist whether variations. *Gamo* people use *Utha* whenever they like to use without depending the season. It is believed that if the house owner has plenty of "*Utha*" plant, then he is considered as rich family which will give him high respect with the villagers around the area. The next to *Utha* is barley, highly produced food type in *Gamo* societies.

Even if, the "Utha" is taken the assurance for their life, they give priority for Barley. They can prepare barley as different forms of food items especially, during in cultural ceremonies and different festivals. It is also use in their well coming guests. Therefore, barely is the mother of agricultural products in their area.

Figure -16- Gamo society land use Figure -17-"*Utha"* plant around the house

Figure-18- Barely plant

Domestic animals which are important for economic sources are caw, ox, sheep, goat, hen, horse, stallion, mule, donkey, etc. among those sheep is the most popular one. They are not harvesting sheep for meal and tanner purpose rather they use for soil fertilization and as many for exchange. For example, when they want to buy caws, food items, farming land etc they negotiate by number of sheep. Because of those reason *Gamo* peoples try to own number of sheep.

Figure -19-Domestic animals: - Sheep, caw, donkey in the field

There are other sources which are support the economy of *Gamo* society. Thus are hand crafts, Metal work, Wood work, tanner, Palm tree leaf work, Bamboo work, Pottery making etc but hand weaving plays great income earner among the other crafts.

Figure-20- Handcrafts in *Gamo* society

The *Gamo* people in Ethiopia known by artifacts so called weaving and particular cultural and respectful cloth known as *Dunguza / Hade/ Bunguza* having three predominant colors such as Red, Black, Yellow regardless designing. [4]

Figure-21- Gamo people cultural elder

Figure-22- Gamo people cultural festival

Figure-23-*Gamo; Dunguza / Hade/ Bunguza*

3.6. Factors for the disappearance of vernacular houses

Today more species of plants and animals are endangered than ever before- and it is we human beings who are responsible. Similar to this, *Gamo* vernacular houses are also on the way of disappearing. The following are the main factors which are causes disappearance for *Gamo* vernacular houses.

1. ***Climate change***

Climatic factors affecting life in the environment including temperature, rain fall, humidity, solar radiation (light), wind and pressure. Temperature is the most important factor that influences almost all the activities of organisms. Many organisms tolerate temperature changes by certain metabolic process and structural adjustments. For example birds hibernate and migrate to warmer areas when the temperature becomes very cold. On other hand very cold temperature affect some other forms of plant and animal life.

2. ***Misunderstanding on Civilization***

Civilization is sometimes controversial term that has been used in several related ways. Primarily, the term has been used to refer to the material and instrumental side of human culture that is complex in terms of technology, science, and division of labor. People were called "civilized" to describe a society or country that has a highly developed system of government, culture and way of life and that treats the people who live there fairly.

3. Neighbors hood influence

A neighborhood influence is in social psychology; influence in interpersonal relationshipsofa geographically localized community within a larger city, town or suburb. Neighborhoods are often social communities with considerable face-to-face interaction among members.

1. ***Shortage of construction raw materials***

Gamo society give highly respect for their culture. The culture is implemented on social life. And their day to day life is interrelated with their vernacular houses. But now a day the raw materials are not available enclose to their community as before and also becoming costly to buy.

2. Fear of fire

Fire is its most communal in rural areas which has the potential to cause physical damage through burning.

3.7. Impacts of vernacular house disappearance

Recycling refers the continuous exchange of materials between the living and non living components of the ecosystem. All of these elements that occur within communities include "*Keeththa*"/vernacular house/, home animals, crop plants, *"Uuththa"/false banana/* as well as a number of others cycle through ecosystem. Without the recycling of these elements life in the ecosystem could not have existed continually or it became distort from usual.

Gamo vernacular houses are interrelated with the environment. We can see the interrelation in each of the five parts. The first one is ending the smell and making ready to become comfortable to live in. It has only one get which means that there is no extra door rather than the main get. When the smoke is taking place the little of it are absorbed through their roof with small openings, protest flays and the other different insects, avoids bad smell of the animals inside the house, absorbed by "*Uutha*" around the house by their leaves, finally it evaporates in the process of transpiration. And when they add Ash to the dung of home animals it also treats the

bad odor. Behind of this all reasons the house able to control the weather of inside. This means when the outside weather is cold, the inner part of the house becomes hot. Therefore, the community habitants feel comfort.

Figure -24- *Gamo* society livelihood recycling

Figure -25- enterer view of *Gamo* vernacular houses

Figure -26- exterior view of *Gamo* vernacular houses

The second is familiarized with "*Utha"*.If the plant "*Utha*" is near to the house, it can absorb more smoke which exhaled from the house. Then the "*Utha*" will grow fast and the leaves became wide.

Figure -27- "*Utha*" plant near to the house

Thirdly it is interrelated with domestic animals such as Cows, Ox, Sheep, food items, farm lands and etc. When they want to by one of them they use to negotiating by number of sheep.

Figure-28- Domestic animals on the market

The fourth is highly linked with crop production**.** Those domestic animals eat more "*Utha's "* leaf and other grass. Similarly the people can get more dung after feeding those animals. From this animals' west the liquid part is taken to the "*Utha*" and the dung is taken as fertilization for farm crops. After using this fertilization the steam of barley and wheat become long in height and strong. This steam is used as cover for *Gamo* vernacular houses in highland areas.

Figure-29- The relation with in between Domestic animals, *Utha*, crops/ barley and the house respectively

The last is nearly similar with the extinction of the next generation in that society, if there is no radical solution. Based on the above co-relation; - students visit the animals, study subjects and do their homework on the field after attending their class. And they are having their school materials such as exercise book, reference materials, cloth and others basic need by selling those animals. Basically the students and these domestic animals have

strong relationship with each other. For example, if the domestic animals become disappear the students are exposed to waste their time and migrate to anther towns/ cites.

Figure-30- The relation with youth and Domestic animals

There are now more peoples on earth than ever before. Human beings can live in many different places on the earth and can adapt too many different climates and habitat However, many plants and animals species can only live in one sort of habitat. When human beings interfere with these surroundings, for example, by cutting down forests, many of the plants and animals that live there cannot survive. As result, an entire species can soon become extinct.

Figure-31- "*Utha*" plant near to the CIS building House

Human beings have caused three kinds of danger for animals. Firstly, they have changed or destroyed the plant life of huge areas of the world. They have done this to clear the land for agriculture, to build settlements or obtain timber. Secondly, they polluted the air, the land, and earth's water with chemicals. Finally, people have copied the life from abroad for being civilization. As a result of these activities, some species have become very rare or have already become extinct.

4. Conclusion and Recommendation

4.1. Conclusion

The result of this study showed that *Gamo* society is inter-linked to the vernacular houses. There are three major types of *Gamo* vernacular houses: *Waje, Kara* and *Yara.* These varieties of houses are happen because of social value, weather condition and the available materials which they have in their enclose community. *Gamo*

society give highly respect for their culture. The culture is implemented on social life. And their daily life is inter-linked with their vernacular houses. But now a day the raw materials are not available enclose to their community as before and also becoming costly to buy.

4.2. Recommendations

Based on the finding of the study the following recommendations were forwarded:

- To sustain social and cultural life of the society, especial attention has to be given for vernacular houses and for its construction materials. The Agriculture office and Culture and Tourism Office should provide methods to keep and sustain this Grass, Bamboo and other raw construction materials because of their multi-dimensional advantage for the community.
- Because of social and cultural values of Vernacular houses; Architects and Engineers have to focus on the novel tactics for efficient management of the culture system expedient.
- The government has to identify growth inducing agents, to build capacity of professional planners, Architects, Engineers and managers to re-invigorate in the design with collaboration of culture development and Construction in towns.
- All concerned bodies should transform the indigenous house construction materials surpluses from the material production process into manufactured goods if small and medium town settlements are properly utilized since the presence of agro-allied industries would also guarantee employment and consequently raise income levels.
- In addition to this architectural investigation to understand why things were constructed the way were, the author recommend archeologists to record the form of the parts that survive and the tools used, and other branches of history. And also I recommend Architects and Engineers to Integrating *Gamo* vernacular houses science in the present needs of eco-friendly architecture, design with climate, law- cost construction techniques and Sustainable & Green architecture.

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Appendix

No	Name	Sex	Age	Clan	Dere	Sub Dere	House type	House cover
1	Getachew, Haylu, Hagelo	Male	38	Hawure	ocholo/chano	Mile	Goda	Gata
2	Samu'el, Wangala, Wanke	Male	52	Argama	ocholo/chano	Dorga (Kola)	Goda , Kara	Gata
3	Bekano, Baruda, Bade	Female	35	Golo- mala	Zigit baqole	Shale	Elpine&Amere	Giste buxa
4	Gezahegn,Gebela	Male	25	Gawo- mala	Shara	Kola-Shara (emba)	Kara	Gata
5	Lale, Asefa, sadid	Male	57	Amara	K'ola-Shara	Emba	Kara (Goda)	Gata
6	Shendere, Sen'a, Sesa	Female	38	Buylu	Shara /Kola shara	Kusheta	Kara	Gata
7	Tadese, Tayle, Hulugo	Male	52	Gawo- Mala	Shara	Kola shora, kurshato	Kara Kethsa	Gata
8	Siko, Shinale, Shika	Male	48	Amara	Ganta	Ocholo,	Elfine and Gabara	Gata
9	Bekele, Dantse, Dale	Male	31	Kuyla	Tsayte	Dheskele	Elfine	Butha
10	Deneke,Dalo,Hingo	Male	37	Shayre	Zigite	kua/Golaso	Elphine	Butha
11	Washo,Wango	Male	41	Zulesa	Gaxe	Orga	Elfine and Gode Ketha	Giste butha
12	Fino, Kareto, Ambe	Male	108	Buyla	Wusamo	Kodo	Elfine	Butha
13	Dan'el, torche, tomba	Male	47	Suga	Kuyle	Enke	Elfine	Buxa
14	Gezahign, Tela, Tengo	Male	47	Zozo mala	Gulta	Bula	Yana and Elfine, Kara	Buxa ,Gata, Qata,
15	Shila, Anza, Guyta	Male	50	Lontsa Mala	Wobara	entata	Elfineshocha, Goda	Qata, gata, buxa
16	Toncha, Tola, Dolge	Male	99	Qogo mala	Qogota	Gema (Daga), Mogisa	Gulanta, Goda	Gata
17	Maxine, Maydo, Mado	Male	60	Gezo mala	Qogota/ Mafu&Zolo	Goydana	Yara and Goda	Qada, Gata, Gistebuxa
18	Brihanu, Moges, Ako	Male	36	Kashta	Doko	Losha	Yara and Kara	Gata, Qata, Buxa
19	Kuru,Gemeda, Orqe	Male	61	Bola	Doko	Shaye, Ote	Goda and Yara	Qata,Buxa, Gata,
20	Falahe FintsaTola	Female	65	Chila mala	Qogota/Ezo	Chuskoto	Yara/ Kara	Gata, Qata
21	Admasu, tubok'o, Tutu	Male	30	K'ogo mala	Doko	Losha	Shocha /Kara	Qata, Qata

22	tikola, temato, Made	Male	57	Dorze mala	Bonke	Garsedha	Elfine	Buxa
23	Akako, cuntaro, afra	Male	51	Gayza	Bula/Gerese	Burda	Wage ,Eilfine, cobre	Butha
24	Mandosha, Manze, Man'o	Male	35	Maka	Gerese	Bula/Gara	ElfineKobre, zufa	Butha
25	Arpha, Aweke, Akalo	Male	40	Bobo	Kamal/Barie/Oro	Goha	Elfine	Butha
26	Kancho, Goncho, Harqa	Male	55	Maka	Balta	Telo	Waga,Kara ,Kobre,Elifine	Butha
27	Tsilose, chibo, saqimo	Male	50	En'e	Algude	Gone	Elphine	Butha
28	Tsilose, chibo, saqimo	Male	50	En'e	Algude	Gone	Elphine	Butha
29	chiro,Chibo, Saqimo	Male	60	En'e	Dere- Algude	Gone	Elfine /Kobrie	Butha
30	Kabso,kale,Kare	Male	30	Gawo Mala	BonkeYela	Garsedha	Kara Worage, EliFiguren	Buxa
31	Gecho, Gergeda, Fite	Male	38	Kale	Kam'al, Barie/Oro	Oro	Elfine	Butha
32	Grtu, Aleme, Mezo	Male	39	Amar	Zargula	Pudale, shirble	Zufa, Goda	shaca
33	Tukulo, Marxa, Aro	Male	60	Zawura/ Maka/	Zadha	Giyasa,ache	Qotsa/Yarashocha, &elfine	Gata, Buxa
34	Dalancho, Daira, Yancho	Female	60	K'oGo-mala	Dita	Gana-Kare	Qotsa/YaraKatsa & Gabara, Elifine	Butha, Dupa/ kata
35	Hazo, Ambese, Dazo	Male	57	Zawura	Zadha	Gigasa	Yara, Gabara, Kara	Gata, Qata,Buxa
36	Danxo, dasale, Danqa	Male	37	Amara	Ko'do/Xela	Qarama/Duno	Yara/shocha,Kora/Gode	Dupa and butha
37	Shanto,Tola, Goba	Male	70	Zawura	Lisha/Zadha	Gayla	Yara and Kara	Gata, Qata
38	Oto, Oyqa, Ayo	Male	65	Golomala	Hanqa	Garsahanqa/Sobo	Ghiro, Zufa	Dupa
39	Bafena, Tesfaye, Ababe	Female	55	Amara	Otolo	Doja	Chiro, wage, Elfiign	Coata
40	Gebre, aysa, Ditse	Male	40	Golo-mala	Dara/ Shelasubo	Alkasha	Kara, Woraga, ZufaElipign	Dupa
41	Gage, Gabo, Gangale	male	65	Gawo Male	Dara	Dara dime	Kara elfineGalara	Gata
42	Wayca, El'o, Echa	Male	70	Kogo mala	Andro	Bare	Kara +elfine	Gata
43	Balcha, Hylasho, Harado	Male	43	Xami mala	Guge	Boyre/bodha	Elfine	Upergata ,Lower buxa
44	Tonche, Dara, de'ta	Male	65	Golo-mala	Hanqa	Garsa-hanqa/Sobo	Chiro, Zufa	Dupa

45	Worku, Bodha, bonche	Male	48	Gamo mala	Kamba	Utsuma	Kara Ketha	Gata
46	Halto, A buno	Male	67	Kale	E'le	Kodo	EliFiguren,Gabara, Kara	Gata
47	Elico, Barata, Bade	Male	55	Boroda mala	Boroda	Kodo Moko/Garo	Delle/Elfine	Gata
48	Marmaca, marcila, Ashiko	Male	57	Dufa	Garda	Durbale	Waje and Elfine, Kara	Gata,
49	Solomon, Kusa, Angota	Male	35	Dogala	Kucha	Morka, giyasa	Elfine&Zufa	Gata
50	Elfagida, W/mical, Trife	Male	60	Amara	Kucha/Morka/Masha morka	Giyaqodhe	Kara ,EliFiguren,Zufa, Worage	Gata
51	Tadese wolde	Male	50	Kogo-Mala	Choye	Fango	Elfine	Buxa /gata
52	Habte Ambo Daka	Male	29	Ele Mala	Manana	Selo	Delle	Gata
53	Galtsa Gani'e Arba	M	47	Masha	Lefe	Koyawra	Elifine/Gabara/Delle	Butsa/gata
54	Begara Beta Bele	M	37	Gussa	Choye	Garcho	Elifine/Gabara/Delle	Buxa /gata
55	Duzame Dube Durche	M	59	Mazire	Dingamo	Boola	Gabara/Delle /Elifine	Buxa /gata
56	Awoke Doboche Doja	M	62	Wobulo	Haringa	Sile	Gabara/Delle /Elifine	Buxa /gata
57	Kalile Adasho Adh'o	M	33	Zawura	Anko	Dola	Elifine/Gabara/Delle	Butsa/gata