



COLLEGE OF SOCIAL SCIENCE AND HUMANITIES

DEPARTMENT OF GEOGRAPHY AND ENVIRONMENTAL STUDIES

**ASSESSING AGRICULTURAL LAND SIZE FRAGMENTATION AND
IT'S ECONOMIC EFFECTS: IN THE CASE OF EZHA WOREDA IN
GURAGE ZONE, CENTERAL ETHIOPIA.**

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Assessing Agricultural Land Size Fragmentation and Its Economic Effects: In The Case of Ezha Woreda in Gurage Zone, Central Ethiopia Region

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Declaration

Fistum Tamirat and Thomas Kebede do here declare to Wolkite University Department of Geography and Environmental Studies the senior essay entitled “Assessing Agricultural Land Size Fragmentation And It’s Economic Effects: In The Case Of Ezha Woreda In Gurage Zone, Central Ethiopia Region during the 2024 for the requirements of bachelor degree of art in Geography and Environmental Studies we further affirm that our work has not been presented to any others universities or institutions for the award of any degree or diploma.

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ACRONYMS

CSA Central Statistical Agency

CWB Warm and temperate climate

FAO Food and Agricultural Organization

KMOR Kebele Manager Office Report

KM Kilometer

MM Millimeter

MOA Ministry of Agriculture

NGO Non-Governmental Organization

WB World Bank

CE Central Ethiopia

ABSTRACT

The research title is focuses on the assessing Agricultural land size fragmentation and its socio economic effect the case of Ezha woreda Gurage Zone Central Ethiopia. Land fragmentation was a single farm consists of a large number of separated land plots in common agricultural phenomenon in many countries. To addressing of this, issue the study objective were to identify the main cause of agricultural land size fragmentation and its socio economic effect on agricultural land. To achieve this objective, the necessary data were collected from both primary and secondary data source. The samples were selected through a simple random sampling and respondent's interviewee. The total sampling size was 43 respondents. The given data were analyzed using qualitative and quantitative method. The present land holding or plots of land of farmers were located in difference places. The finding indicates, majority of the farmers have less than 1-hectare land in the study area. The major causes of agricultural land size fragmentation in the study area were population growth, land distribution and redistribution, increase number of farmers. The possible solution for agricultural land size fragmentation and its socio economic effect in Ezha woreda is controlling the population and creating job opportunity other than agriculture.

Key Words

Crop production, Economic effect, Land fragmentation, Land size, Population growth

CHAPTER ONE

1. INTRODUCTION

1.1 Back Ground of the Study

Agriculture is the main stay to about 85% of total population in Ethiopia and dominated by small holders. Farm land is the basic agricultural resource and is becoming constraint in production. Agricultural land fragmentation refers to when farmers operating two or more geographically separated tracts of land, taking accounting of the distance between those parcel. (Bizimana et al, 2014).

Land fragmentation often considered as the source of inefficiencies in land productivity, i.e., the rational use of agricultural land is influenced by land use limitations. One of the obstacles for agricultural development is land fragmentation. (J.Hrstov,).Land fragmentation is defined as the situation in which a single farm Seen ownership consists of numerous spatially separated plots.(j.W.Bentley,).Land fragmentation has been a prominent feature in many countries since of least the 17 century the existence of fragmented land holding is regarding an important Mechanization for the feature of less developed agricultural system . It can be a major obstacle to agricultural causes in efficiencies in production and involves large cost to all deviate its effect (Van hung etal, 2009)

This indicates that agricultural land fragmentation is widespread phenomenon in highland areas of the ethiopia. Inadequate monitoring, and the inability to use citation where a single farm comprises numerous individual parcels of land is a common agrarian feature of many transition economic (Dijk, 2014).

Land fragmentation is side to be constraint to effective Crop production and agricultural modernization in several countries this has resulted in land consolidation program. The existence of fragmentation land holding is regarded an important feature in less developed agricultural system. It has the major obstacle to agricultural activity because it hinders agricultural mechanization cause in effect (Austin etal, 2012).

In the Central Ethiopia specifically in Gurage zone land fragmentation and recurrent drought combine to leave nearly a quarter of the population for food insecurity (ADA, 2014). Land fragmentation is often considered to be an obstacle for improving agricultural productivity (Theesfeld et al, 2012).

Land fragmentation can be major obstacle to agricultural causes in production and involves large costs to all deviate its effect (vea hung mental 2013).

1.2 Statement of the Problem

Land fragmentation has been consider having different advantage and disadvantage and has long history in Ethiopia. The previous government regarding rural administration issued different policy options especially during the previous government. Land fragmentation was considered as an evil to be avoided in any cost (MOA 2011). Land fragmentation reduces risks by giving several of soil and growing condition. Besides the benefits of agricultural land size fragmentation in Central Ethiopia region result in economic use of land as well as labor resource in other words farm land holding are diminished to the level that it could not support the requirement of the family and fragmented in small parcel scattered over area as long as peasant lack of an area of plot of land and investment increase for an area productivity cannot crop with population growth (Ibid).

There are various problems but the major problem is population growth, unequal distribution of land size for the society. Traditional tenure arrangement and small size of landholding are common problems in Gurage zone especial in Ezha woreda (MOA, 2017).

There are not many studies conducted related to land fragmentation in the country in general and Gurage particular at different levels. Most of the studies, (around Agena) focused on the land tenure, land certification, and other related issues, which ignores the land fragmentation issues even if it is critical for productivity. In light of this, the study area, that is, the highland districts of Gurage Province, is characterized by small farm holding divided into small strips scattered over distant areas. Hence, land fragmentation appears to be the most acute problem of smallholder agriculture in the highland areas where majority of the people reside.

Therefore, it is self-justifying to give priority for investigating economic effects of agricultural land fragmentation in the highland areas. Moreover, the advantages and disadvantages of land fragmentation depend entirely upon the local economic and natural environment. Each community should be considered as a unique case before a government decides to undergo any change against land fragmentation. Hence, this study was initiated to produce empirical information which serves as a basic source specifically about the districts and provide additional knowledge concerning land fragmentation and its effects to smallholder farmers' land productivity and farm income. The researcher to conduct this agricultural land size

fragmentation is small size agricultural land has been distributed several times in SNNP region including Gurage being equity among farmer in their ownership and belongingness (own completion) Therefore this study assessed agricultural land size fragmentation and its economic effect in Ezha woreda.

1.3. Objective of the Study

1.3.1. General Objective

The general objective of the study is to assess agricultural land size fragmentation and its economic effects in Ezha woreda, Gurage Zone, Central Ethiopia.

1.3.2. Specific Objective

The specific objectives of the study are;

1. To examine the land size of the study area
2. To investigate the impact of agricultural land size fragmentation on farm production in the study area.
3. To identify the main cause of agricultural land fragmentation in the study area.
4. To assess the socio-economic effects of agricultural land fragmentation in Ezha woreda.

1.4. Research Question

To achieve the objective of the study the researcher was forward the following question;

1. What is the current land size of each households of the study area
2. What is the impact of agricultural land size fragmentation on farm production in Ezha woreda?
3. What is the main cause of agricultural land size fragmentation in the study area?
4. What are the economic effects of agricultural land fragmentation in Ezha woreda?

1.5. Significant of the Study

The result of this study has the following importance. The study on agricultural land size fragmentation can contribute to the understanding of land fragmentation and its effects at household and community level with respect to the existing attitude towards it hence ,policy makers could be understand and make use of information about merits and demerits of

agricultural land size fragmentation at household and community level. Finally, the result of this research may be useful for governmental and non-governmental organization dealing with land use planning and extension activity. It helps to reduce negative impact which exerts force on the farmers.

1.6 Scope of the Study

The study was conducted to assess the agricultural land size fragmentation and its economic effects. The reason that researchers select the topic agricultural land fragmentation was on the base of background knowledge to this problem existing in the study area for problems like conflict between the families when the lands were fragmented and crop production is directly decreased.

1.7 Limitation of the Study

The major problem face during data gathering was shortage of time, financial problem and another problem during the study was reluctance of the respondent to fill the questionnaires. This may be data several reasons such as inability to understand the necessity of the researcher and overburden of work.

1.8 Organization of the Paper

This study has three chapters the first chapter incorporates background of the study, statement of the problem, objectives of the study, research question, significance of the study, scope of the study, limitation of the study and organization of the paper. The second chapter also includes review of related literature, the third chapter deal with the description of the study area in this chapter the place where this study will be briefly describe.

1.9 Ethical Consideration

In order to get the essential information and for the success of the research, it is the better to get smooth communication among our informants. So the researcher will uses to different ethics to hiding their secrets and also giving the right to comment on the research process.

CHAPTER TWO

2. REVIEW OF RELATED LITERATURE

2.1 Agricultural Land Fragmentation

Agricultural fragmentation refers to the division and sub division of agricultural land in to smaller and more scattered parcels, often due to factors such as inheritance, land policies, migration and land markets. These phenomena can reduce the overall productivity of the land.

Agricultural land fragmentation is widespread in the world and the result of various institutional, political, historical and sociological factors such as inheritance laws collectivization and consolidation processes. transaction cost in land market urban development policies and personal valuation of land ownership. Land fragmentation is considered division of farmland in to small farm as agricultural land size fragmentation. As a single farm considering numerous discrete parcels of the scattered over wider area evaluated both the cost and benefits of land fragmentation in the case of rice production in Japan similarly to Rah man (Kawasaki, 2010)

2.1.1. Advantage of Agricultural Land Fragmentation

Land fragmentation, while generally associated with negative ecological impacts, can also have potential benefits such as increased biodiversity, creation of edge habitats, enhanced connectivity for species movement, conservation opportunities, and cultural and recreational value. Careful management and planning are essential to maximize these benefits and minimize negative impacts.

2.1.2. Disadvantage of Agricultural Land Fragmentation

Land fragmentation is said to harm productivity in a number of ways (decrease agricultural productivity). Decline agricultural productivity, as it is more challenging to implement modern farming techniques or mechanization on smaller plots. first fragment land can increase transport cost. If the plot are located far from the home and far from each other there is a waste of time for the workers spent on traveling in between the plots and home management supervision and securing of scattered plots can also be more difficult time consuming and costly

small and scattered plots waste land area and require more land for fencing border construction and paths and roads.

Secondly, fragmentation of agricultural land often leads to land degradation and increased soil erosion, as smaller plots can be more vulnerable to the impacts of wind and water. It also becomes more difficult to implement soil conservation measures like crop rotation and contour farming in fragmented landscapes. Thirdly, inefficient use of facilities and public service. Fragmentation can result in poor access to facilities like roads, market, school etc. farmers may have difficulty accessing markets and selling their produce, contributing to low farm incomes and food insecurity.

Land fragmentation might also increase the risk of disputes between neighbors' (Web Arose, Gaynor Richard, 2012).

2.1.3. Cause of Agricultural Land Fragmentation

There are several causes of agricultural land fragmentation, including inheritance law and practice, population growth, land sales and transactions, land reform policies, urbanization, infrastructure development, cultural practice, tenure systems and so on.

The cause of agricultural land fragmentation vary in different country's land fragmentation commonly results when implementation agrarian reform but ,the phenomenon has developed in different ways in different country's land distribution and redistribution ,population growth ,subsistence cropping ,social ,cultural ,economic and physical processes are considered as causes of land fragmentation(Ten et al,2010-11).

2.1.4. Economic Impact of Agricultural Land Fragmentation

The increasing population size of rural Ethiopia and the limited total land area .Especially in the high land farming area has been the cause for decaling perceptual landholding studies suggest that on average small land holding less than hector household most of the small plots of land is devoted to food production, but households seldom produce enough crops to meet their family's consumption requirement.

As the land is too small to produce any marketable surplus under the prevailing conduction. Subsistence and survival are over three riding concerns of the farmer this result in lack of cash of investment purchase of commercial inputs and purchase of oxen for land preparation (Ayele, 2023).

2.1.5 Socio Economic Effects

Land fragmentation refers to the division of large agricultural land holdings into smaller parcels. This can have several socio-economic effects, including:

1. **Decreased agricultural productivity:** Land fragmentation can lead to inefficient land use practices; as smaller plots are often less productive than larger ones. This can result in lower crop yields and reduced agricultural output, which can impact food security and rural livelihoods.
2. **Increased production costs:** Fragmented land holdings can lead to higher production costs, as farmers may need to invest in additional equipment and infrastructure to work on multiple small plots. This can reduce profitability and hinder economic development in rural areas.
3. **Limited access to credit and resources:** Small-scale farmers with fragmented land holdings may have difficulty accessing credit and resources, such as agricultural inputs and technology. This can limit their ability to invest in their farms and improve productivity, further perpetuating poverty and inequality.
4. **Land tenure issues:** Land fragmentation can also lead to complex land tenure issues, as multiple owners may have overlapping rights to the same piece of land. This can result in disputes and conflicts over land ownership, hindering investment and development in rural areas.
5. **Migration and urbanization:** Land fragmentation can contribute to rural depopulation; as small-scale farmers may struggle to make a living from their fragmented plots. This can lead to increased migration to urban areas in search of better economic opportunities, leading to further challenges for rural communities.

Overall, land fragmentation can have significant socio-economic impacts on rural communities, affecting agricultural productivity, livelihoods, and access to resources. Addressing these challenges requires comprehensive land reform policies that promote more efficient land use practices and support small-scale farmers in improving their productivity and livelihoods.

2.1.6 Farm Size Land Fragmentation and Small Holder Production

Ethiopia is country of smallholder agriculture in the 2000 cropping season 87.4 percent of rural household operated less than 2 hectares. Whereas 64.5 percent of them cultivated small farms are fragmented on average into 2.3 plots the average farm size can generate only about 50 percent of the minimum income required for the average farm households to lead a life out of poverty. Farm size been taken to be synonymous with farm acreage because it can easily be ascertained and is sold days worked off-farm (for small-scale farm) level of farm income. To the level of

total family income has commonly. If currently levels of farmer productivity and prices structures remain constant. such farmers have little (Samuel, 2010).

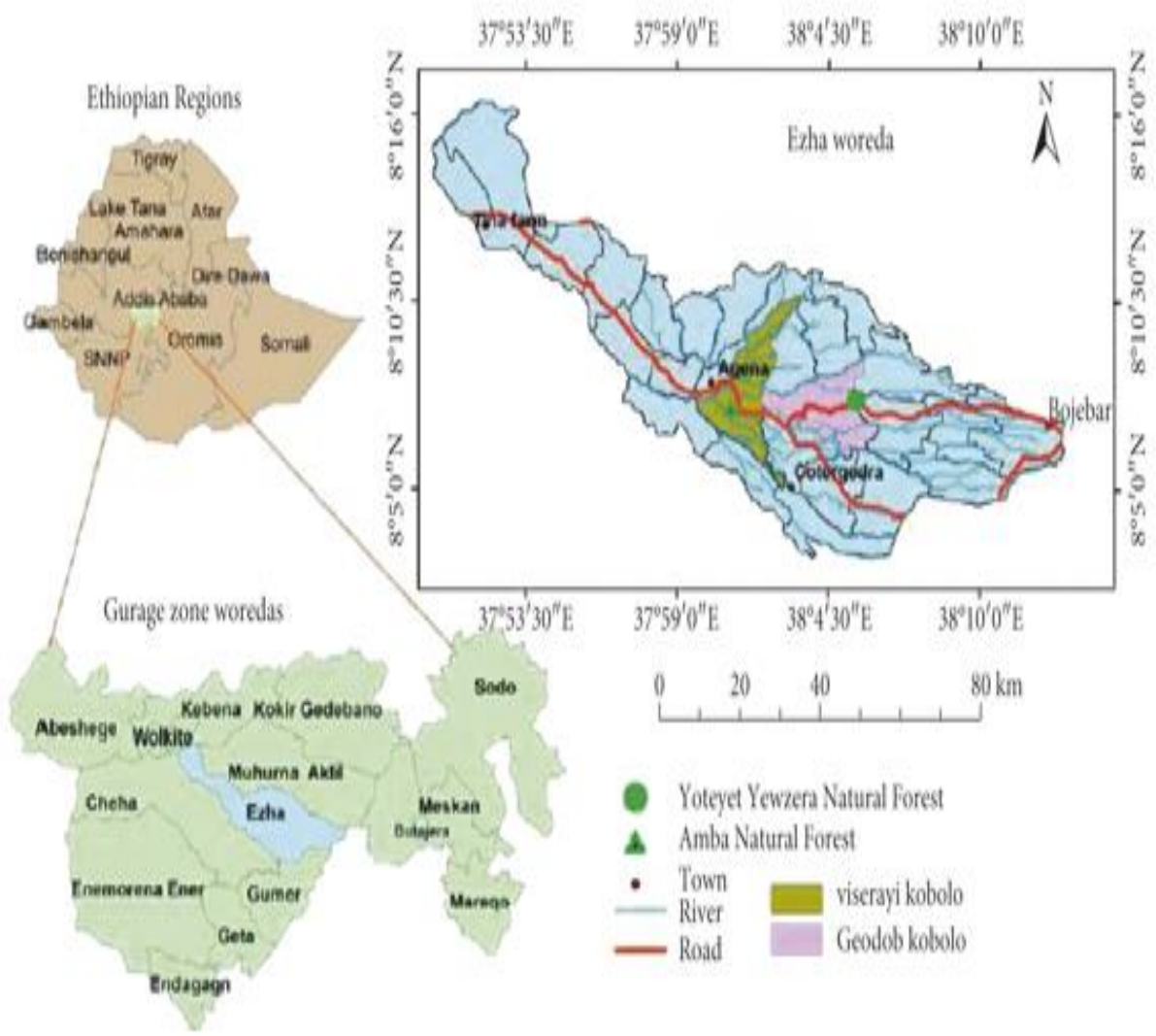
CHAPTER THREE

3. RESEARCH METHODOLOGIES

3.1 Description of the Study Area.

3.1.1. Location

Ezha is one of the woreda in Gurage zone, Central Ethiopia. This woreda is named after the subgroup of the Sebat Bet Gurage, the Ezha. Part of the Gurage Zone, Ezha is bordered on the south by Gumer, on the west by Cheha, on the north by Kebena and Muhor Na Aklil, and on the southeast by Silt'e Zone and meskan. The major town in Ezha is Agenna. It was part of the former Ezhana Wolene woreda. The woreda is 35 km away from the town of wolkite and 185 km away from Addis Ababa. Latitude 8.1537° or $8^{\circ} 9' 13''$ north Longitude 37.9942° or $37^{\circ} 59' 39''$ east respectively and elevation 2,273 meters (7,457 feet) above sea level.



3.1.2 Topography

The topography feature of the woreda consists of plain, mountain and valleys. The altitude or elevation of Ezha woreda is 2273 M (EWADO, 2017).

3.1.3. Climate

The range of annual temperature of Ezha woreda varies from 21° c-14° c. Its climate has seasonal variation. the annually rainfall varies from place to place between 1100 mm to 1620mm. The Ezha woreda is characterized by small rain from March to May, heavily rain from June to September and the amount of rainfall become being decreases from October to February, and however, the climate of Ezha woreda is more of woina dega (CHM, 2014).

3.1.4. Soil type

Soil is loose or unconsolidated uppermost part of the earth's surface. According to Ezha woreda agricultural office, the study area is characterized more than one kind of soil. The types grouped in different category based on the color. The types of soil is available in the study areas are black soil is 65% red soil is 13% and brown soil is cover 22% (Ezha woreda agricultural and rural development office, 2017).

3.1.5 Vegetation

The study area has different agro-climatic and topographic environments; the distribution of vegetation also goes in line with this agro climatic and topographic landscape. The existing natural forest the major are include Bahirzaf (Eucalyptus camadulensis), niche Bahirzaf(Eucalyptus globules), shola (focussure), wanza (coda Africana), warka (Focusvista),shisho (ceticsorcane), kosso(Hageman Abyssinia), tsid (yefanji) etc. (Ezha woreda agricultural development office, 2017).

3.1.6 Land use type

Land use is a series of operation associated with input on land, carried out by humans with intention to obtain product and or benefits through using land resource. The land use structure of the study is having been changed over time. There is clearly seen mainly in highland and low land areas. In high land areas farmer are replacing tier crop land with eucalyptus plantation whereas low lands substitute their land with chat and enset. Land use change and land

fragmentation in the study area worsening factor for natural resource degradation. A important cash crop include corn, wheat barley local of cabbage and potatoes.

3.1.7 Population

Based on the 2007 Census conducted by the CSA, this woreda has a total population of 84,905, of whom 40,261 are men and 44,644 women; 50% of its population is urban dwellers. The majority of the inhabitants practiced Ethiopian Orthodox Christianity, with 65.61% of the population reporting that belief, while 31.47% were Muslim, and 2.35% were P'ent'ay (Protestants).

3.1.8 Economic activity

According to Ezha woreda agricultural rural development office (EWARDO, 2017), 60% of population is living on rural area, where agriculture is the typical employment sector, small holding peasant agriculture is dominant economic activities in the area and average land holding size is around 1.5 hector/HHs. The dominant agriculture activity of the study area is compos both crop production and livestock production. The most common crops that grown in the study area wheat, barley maize, bean, sorghum, pea etc. a vegetable and fruit produced in the study area include onion, potato etc. ensets are typically staple food whereas chat and coffee are major cash crop in the study area. Coffee is the most dominant cash crops which creates favorable condition for activities of trade of woreda (EDWARDO, 2017).

3.2 Research Methods

3.2.1 Research design

Survey type of research design is used for this study. Because survey studies are conducted to detail description of the existing phenomena condition with term of employing data to justify current condition, by using this research type the study obtained precise general information about the current feature of the society and its very important to drown conclusion from the reality .The study was conducted on agricultural land size fragmentation practice in the study area .In this method the researcher employed both quantitative and quantitative type of data.

3.2.2. Type and Source of Data

The relevant data source for this study is including both primary and secondary data source. Primary data source was field survey through the use of questionnaire, interview and secondary

data were collected from land administration offices of document, book, literature documents report and internet service.

3.2.3. Instruments of Data Collection

3.2.3.1 Primary Data Collection

Questionnaires

This instrument involves closed ended and open ended questions was basically construct and employ to generate data household heads of agricultural land size fragmentation.

Interview

The different checklist was prepared among at gathering the required information from different number of respondents this were selected from rural kebele administrative office, woreda agricultural office and other household heads or farmers.

Focus Group Discussion

Focused group discussions were held with eight randomly selected persons from different backgrounds in two groups by dividing four in each group from the sample kebele. The elderly farmers, village leaders, developmental agents and socially respected farmers who are known to have better knowledge on the present and past environmental, social and economic status of the study areas, to substantiate the data collected. Selected questions from structured and unstructured questionnaire were used to focus group discussions. About the cause of agricultural land fragmentation, effect on agricultural productivity and economic effects of agricultural land size fragmentation.

Field Observation

Field observation was started while writing the proposal and continued onto the whole process of data collection to make sure the validity of acquired information. It was aimed on understanding the local condition of the community in terms of their socio economic condition, current condition of land fragmentation, during the walk, the researcher took notes on the cause of land fragmentation, effect of agricultural productivity and take notes about economic effects, yield conditions and topography. Infrequently, informal interviews were carried out with farmers who were met along the path that was aimed on obtaining information to produce structured

questionnaires which is the core instrument for collected information and were conducted in an informal.

3.2.3.2. Secondary Data Collection.

The secondary data were obtained from previous related researches, books, and census report. This secondary data was accessed mainly through soft copies over the internet both hard copies found in the woreda offices, libraries were also use.

3.3 Sampling Size and Sampling Techniques

In Ezha woreda there are 24 kebeles out of this three kebele was selected by using simple sampling techniques. Because, full awareness about socio-economic performance of the society, and this kebele was highly affected by land fragmentation due to high population growth, and not cover all kebele to increase sample size.

The sample size was selected through simple random sampling techniques. because it give equal chance for household and also used increase the reliability ,accuracy of data and time save in the selected kebele the total number of household were 800 from this the researcher selected 43 households by using sample size determination formula with 0.15 level of uncertainty or 85% level of confidence i.e. $1-0.15=0.85$, $0.85*100=85\%$ as the level of precision decreases the sample size will be increased and it will not be manageable, that is why 0.15 taken as level of precision. (KMOR, 2009)

By using Yamane formula

Sample size determination formula:

$$n=N/1+N(e)^2$$

$$n=1800/1+1800(0.15)^2$$

$$n=1800/1+1800(0.0225)$$

$$n=1800/1+40.5 =43$$

Where, n=sample size

N=total population or HH number

e=level of precision

The respondents were selected through accidental random sampling because it gives equal chance, saving time and cost.

3.4 Data Collection Procedures

For the data collection procedures first the researcher was introduced to his/her self to the respondents and gives some information about the aim he/she needs to gather the required information. The researcher have been gathered the information from the respondent by using appropriate information and data analysis by using different techniques. Therefore the researchers collect by prepare questionnaires.

3. 5 Methods of Data Display Techniques

The data were collected through questionnaires and interview the available data of the study was analyzing through qualitative and quantitative. Qualitative data were analyzed in the form the verbal description of the primary data and quantitative data were analyzed by using, table, frequency and percentage. Information obtained through interview and observations were largely qualitative and presented in summarized form to supplement response given to questionnaire's'.

CHAPTER FOUR

4. RESULTS AND CONCLUSION

4.1. Background of the Study

The general purpose of the study was to assess the agricultural land size fragmentation and its economic effects in the cause of Ezha woreda in Gurage zone. In doing so questionnaires that consist of 43 items was prepared. The data gathered were presented one after the other. Almost all the data presented, analyzed and interpreted here are obtained from questionnaires. The questionnaires are filled by Ezha woreda peoples. These designed to assess the existing questions were divided in to five parts as it is shown on the back of the paper. The first part which consists of 8 questions, designed the background information of the respondent. The second part which consists of 1 question related to the to investigate the main cause of agricultural land size fragmentation in the study area. The third part, which consists of 4 questions related to trend of land fragmentation, the fourth part which consists of 4 questions related to how to find out the economic effect of agricultural land size fragmentation and part five which consists of 5 interview questions. The questionnaires were organized based on the sequences which were provided in the questionnaire a total of 43 respondents were taken to fill the questionnaires by Ezha woreda peoples.

4.1.2 Age Structure

It is one of the demographic factors which affect the socio-economic activities.

Table 1- **Sex structure of the respondent**

Sex	Number of respondent	Percentage
Male	28	65
Female	15	35
Total	43	100

Source field survey, 2023.

As indicated on the above table higher percentage of the respondent was male head of household in which accounted 65 percent of the total sample population. The remaining 35 percent of respondents were female headed of household. This indicates the higher of the respondent were males. It indicates culturally the major owners of the lands are males.

4.1.3 Age distribution of respondents by age group

Table 2. Age distribution by age group

Age group	Frequency	Percentage
Above 44	24	56
36-44	12	28
27-35	6	14
18-26	1	2
Total	43	100

Source field survey, 2023

As indicated the above table 2 shows that 56 percent of respondents were found the age group of Above 44, 28 percent of the respondents were found between 36-44, 14 percent of the respondents found between the age of 27-35 and 2 percent of the respondents were found the age

of 18-26years.This indicates the highest proportion of land owned by the respondents whose age are above 44 years.

4.1.4 Educational status

Table 3: Distribution of respondent by educational status

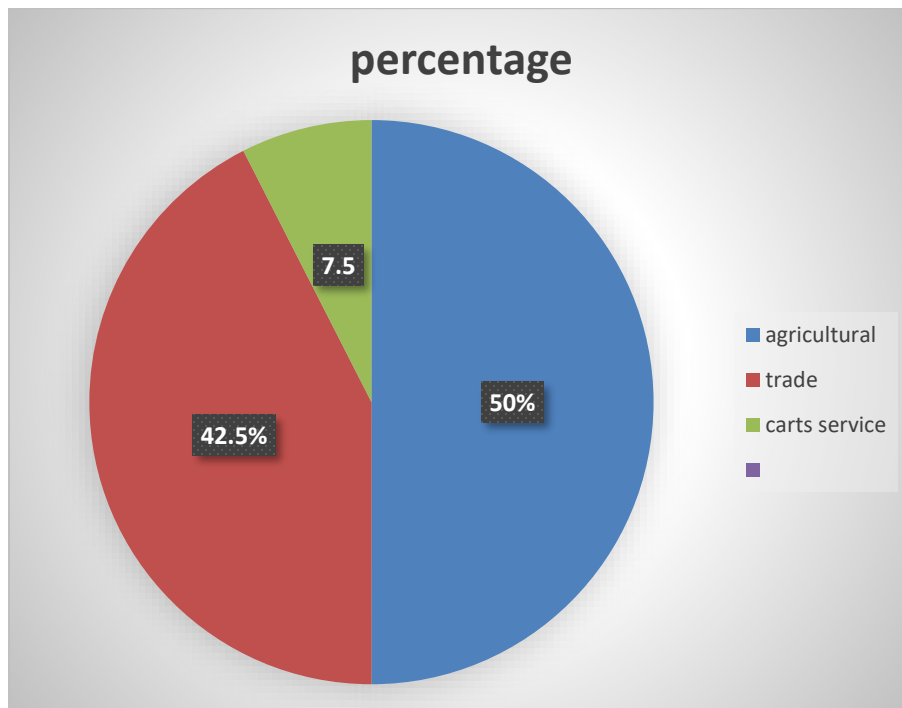
Educational status	Frequency	Percentage
Illiterate	26	60
Literate	17	40
Total	43	100

Source field survey, 2023

As indicated the above table 4.3 the literate accounts 60 percent illiterate accounts 21 percent and 19 percent read and write only. The majority of respondent were literate because the urban household people are educational status of the respondent is very high. this indicate the farming system of the study area are traditional or primitive style

4.1.5 Occupational status

Figure 1: Distribution of respondent by occupation



Source field survey, 2023

As indicated in the above table 1.3, 50 percent were agriculture 42.5 percent were trade 7.5 percent were carts services. The majority of the people in the woreda is engaged by agriculture that create pressure on agricultural land use of the study area.

4.1.6 Marital status

Table 3: Marital status of respondent

Marital status	Frequency	Percentage
Married	22	51
Not married	13	30
Divorced	5	12
Widowed	3	7
Total	43	100

Source field survey, 2023

As indicated in the above table 4 it indicated the majority of the respondent were married which accounts 51 percent it also indicates that 30 percent of the respondent were not married, 12 percent of divorced and 7 percent of the total sample population of respondent were widowed. This shows the married get more lands.

4.2. Land ownership

Table 4: The respondent of land ownership

Questions	Response	Frequency	Percentage
Did you have your own land?	Yes	32	74
	NO	11	26
	Total	43	100

Source file survey 2023

As illustrated in the above table 5 ,74 percent of respondent of the total household reported as they have their own land and the remaining 26 percent of respondents indicated as they have no land. This indicated that the majority of respondents have oven farming land in the study area.

4.2.1Size of land per hectare

Table 5: Amount of land owned per hectare

If you say yes	Response in hectare	Frequency	Percentage
How many lands do you have in hectare?	<1	21	49
	< 2	9	21
	< 3	3	7
	>3	10	23
	Total	43	100

Source field survey, 2023

As indicated in the above table 6, the majority of household respondent had less than 1 hectare of the land. It accounts 49 percent of the total household respondent have less than 1 hectare. whereas less than 2 hectares it accounts 21 percent and less than 3 hectare accounts 7 percent and greater than 3 it accounts 23 percent the total household respondent respectively.

According to Ezha woreda land expert indicates the majority of respondent had less than 1 hectare for individual because of farmer land taken by different purposes like building of school, health station and urban expansion and the construction of industry in this case the farmers have been landless. This indicates that study is known for its highly fragmented land type this affects the productivity the agriculture in the study area.

Table 6. Current agricultural land fragmentation and reason

Question	Alternative	Frequency	Percentage
What look like land fragmentation in Ezha woreda in Gurage zone?	Very high	15	35
	high	10	23
	Medium	12	28
	Low	6	14
	Total	43	100
If your answer is very high and high for the above question what is the reason?	Increase investment	21	48
	Government policies	11	26
	Other	11	26
	Total	43	100

Source field survey, 2023

According to the Ezha woreda in Gurage zone seems land fragmentation is very high, As the table 7 shows us, 35 percent of the respondent express as very high, 23 percent high, 28 percent medium, 14 percent low respectively and 48

percent of respondents that their reason to say increasing investment reason and 26 percent of respondent says government policies and others 26 percent. The land fragmentation of the woreda is high.

Table 7: Impact of land fragmentation on agricultural productivity

Question	Alternative	Frequency	Percentage
Does land fragmentation have impact on your agricultural activity	Yes	24	56
	No	19	44
	Total	43	100

Source field survey, 2023

According to the above table 8, question, 56 percent of respondent is said yes when they asked whether land fragmentation has impact on their agricultural activities, such as shortage of land ,reduced crop product, and increase land rents etc. However, 44 percent of the respondents oppose the above idea.

Table 8: Cause to land fragmentation and transfers of agricultural land

Question	Alternative	Frequency	Percentage
What do you think that the main causes of land fragmentation?	Population growth	23	60
	Traditional Land tenure arrangement	10	20
	Government policy	10	20
	Other	-	-
	Total	43	100

Source field survey, 2023

According to the above table 9 the respondent was asked responding the main cause of land fragmentation in Ezha Woreda is population growth 60 percent of the population of respondent replied that population growth and 20 percent of the respondent is traditional land tenure arrangement is also the cause of land fragmentation in Ezha Woreda, and governmental policy is

20 percent and other respondents replied the cause of land fragmentation. The main cause of land fragmentation in the woreda is population growth.

Table10: Land fragmentation could be a Problem on Your Income

Question	Alternative	Frequency	Percentage
How does land fragmentation could be a problem on your income?	Increase additional expense for land rent	22	51
	Decrease fruit and vegetable product	7	16
	Decrease crop product	8	19
	Decrease animal product	6	14
	Other	-	-
	Total	43	100

Source field survey, 2023

As indicated the above table 11 the respondents were asked about how does land fragmentation could be a problem on their income 51 percent of respondent increase additional expense for land rent, 16 percent of respondent said that decreased fruit and vegetable product , 14 percent were decrease animal product and 19 percent were decrease crop product .

Table 9: Measures of its Economic Effects

	Alternative	Frequency	Percentage
How do you measure its economic effects?	Total employment	24	56
	Value added	6	14
	Business output	6	14
	Other	7	16
	Total	43	100

Source field survey, 2023

As indicated the above table 12 higher percentage of the respondents said that the measures of economic effects is total employment it accounts 56 percent, 14 percent it is value added and business output and the rest it accounts 16 percent others and also aggregate personal income are the other measures of economic effects.

4.2.3 Measures of its economic effects

The economic effect can be measures, total employment, aggregate personal income, value-added, and business output.

Total employment; refers the number of additional jobs created by economic growth this is the most popular measures of economic effects. Aggregate personal income; rises as pay levels rise or additional workers are hired. Value added is a broader measure of the full income effect .it reflects the sum of wage income and corporate profit generated in the study area. Business output (sales volume) is the broadest measure of economic activity as it generates the largest numbers.

According to the respondent's information the total employment of Ezha woreda is very low, due to many reasons such as rapid population growth, shortage of land etc. the paying level of worker are very low due to interest of workers participate in working area is low

CHAPTER FIVE

5. CONCLUSION AND RECOMMENDATION

5.1 CONCLUSION

As mentioned before, the objective of this study is to find out the major problem of agricultural land size fragmentation that affect an economic growth .To accomplish this objective data is collected from sample size and then the data was analyzed by using quantitative and qualitative as well as percentage because of the high population density .Land holding per household is small Population growth, land distribution, redistribution and also increase number of farmers where the major cause of agricultural land size fragmentation in Ezha Woreda. Land fragmentation has a negative impact on farmers productivities in the study area .Because land is fragmented the farmers production is decline, that mines shortage of food decries supply of marketing crop production. Population growth is the major cause of agricultural land size fragmentation in Ezha woreda. Government policy transferring rules are also the cause of land fragmentation in the study area next to population growth Agricultural land size fragmentation in Ezha woreda is very high. The main reason to land redistribution is to allocate land to the society in Ezha Woreda most farmer in Ezha Woreda less than1 hector. That means not self-sufficient in food for their family population growth is also the major cause for land fragmentation. Land fragmentation has a negative impact on the farmer in cultivation quality, duration of work accomplishment and finally crop product decrease.

5.2 Recommendations

Based on the finding the research gave the following possible recommendation in order to minimize the problem or overcome the problem for the concerned body to take an action of solution on it.

The possible solution for agricultural land fragmentation in Ezha Woreda may be;

Control the population growth or limit the population growth and other wisely use land,

- i. To creating job opportunity other than agricultural activities by the local government bodies.

The government particularly ministry of agricultural and rural development should be have to implement regularities that protects the land not to be fragmented as well as the cause of Agricultural land size fragmentations have to be minimized.

- ii. another solution for agricultural land size fragmentation in Ezha Woreda is using family Planning when the family is limited land fragmentation is directly reduces or decrease.

Farmers shall select productive solution i.e. using selective crop seeds, drought resistance crop and productive seeds in a small farming land.

The major impact of agricultural land fragmentation parameters distance of parcels number of parcels owned and average size parcels has to be considered separate to take proper measure on each of them by the farmers.

Policy makers should not overlook the advantages of land fragmentation from the farmers' perspective and they should focus on whether consolidation programs lead to significant productivity that makes farmers better off or not, before issuance of policy on consolidation.

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APPENDIX
WOLKITE UNIVERSITY
COLLEGE OF SOCIAL SCIENCE AND HUMANITIES
DEPARTMENT OF GEOGRAPHY AND ENVIRONMENTAL STUDIES

QUESTIONNAIRE PREPARED FOR SAMPLE HOUSEHOLDS.

Questioners prepared for sample respondents in Ezha woreda. This questioner is prepared for an academic purpose for the fulfillments assess agricultural land size fragmentation and its socio-economic effects in Ezha woreda. Therefore, your response is very important for the success for the study, because all information that you provide determine the analysis and conclusion of the research. Hence, you are kindly requested to give your response by selecting (cycling) your answer from the given alternative choice or describing your opinion.

Please be informed that your response is kept in confidential and you are not required to write your name, and in order to answer the following question.

Part I: Background information of the respondent

1. Age

A. 18-26 B. 27-35 C. 36-44 D.> 44

2. Sex

A. Male B. Female

3. Marital status

A. Married B. Not married C. Divorce D Widowed

4. Educational status

A. Literate B. Illiterates C. Read and write only

5. Occupational status

A. Agriculture B. Trade C. Cart service

6. Family size

A. 1-3 B. 4-6 C. 7-9 D. Above 10

7. Level of income per year

A. <15 B. 15-20 C. 20-25 D. Above 25

Part II: Questions related to investigate the main cause of agricultural land size fragmentation in the study area?

1. What did you think that the main cause of land fragmentation?

- A. Land redistribution
- B. Population growth
- C. Traditional land tenure arrangement
- Government policy

Part III Questions related to trend of land fragmentation

1. Did you have your own land?

- A. Yes
- B. No

2. How much land do you have in hectare?

- A. < 1
- B. < 2
- C. < 3
- D. > 3

3. What looks like land fragmentation in your woreda?

- A. Very high
- B. High
- C. Medium
- D. Low

4. If your answer is very high and high to the above question no, 3 what is the reason?

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Part IV: Questions related how to find out the socio-economic effect of agricultural land size fragmentation?

1. Does land fragmentation have impact on your agricultural activity?

- A. Yes
- B. No

2. If your answer is yes the above question how is it?

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3. How does land fragmentation could be a problem on your income?

- A. Increase additional expense for land rent
- B. Decrease crop product
- C. Decrease animal product
- D. Decrease fruit and vegetable product
- D. Other

4. How did you measure socio-economic effect of land fragmentation?

A. Total employment B. Value added C. Business output D. Other

Part V: INTERVIEW QUESTION

1. What are the socio-economic effects of agricultural land fragmentation?

2. What is the main cause of agricultural land size fragmentation?

3. What is the impact of agricultural land size fragmentation on farm production?

4. What measure are you taking to monitor land size fragmentation?

5. What did you think about role and responsibility of agricultural land size fragmentation?