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ASSESSING THE LEVEL OF INTRODUCE PHYSICAL LAND MANAGEMENT PRACTICES: THE CASE OF JABITEHNAN WOREDA, AMHARA REGION, ETHIOPIA.

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A THESIS SUBMITTED TO THE DEPARTMENT OF *GEOGRAHY AND ENVIROMENTAL STUDIES IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF ART IN ENVIROMENT AND LAND RESOURCE MANAFMENET*.

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An Assessing the level of Introduce Physical land management Practices: The Case of Jabitehnan Woreda, Amhara Region, Ethiopia.

By:

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This is to certify that the thesis prepared by Negash Kassahun, entitled: Assessing the level of Introduces physical land management practices: The Case of Jabitehnan Woreda, Amhara Region, Ethiopia and submitted in partial fulfillment of the requirements for the Degree of Master of Art in Environment and land resource management complies with the regulations of the University and meets the accepted standard with respect to originality and quality.

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ABSTRACT

The study attempt to assessing the level of introduce physical land management practices the case of Jabitehnan woreda, Amahara region, Ethiopia. Under this, the researcher was confirmed to the specific objectives in study area was assessing the implementation level of introduce and indigenous physical land management practices, Assess farmers' perception on introduce physical land management practice and to explore the determinant factors on introduce physical land management practices. The study employed through mixed research method approach. The data collection tools Primary source data were collected by questionnaire surveys, focus group discussions and key informants interviews while secondary data source were collected from relevant publish and unpublished materials. Also the research design using the cross sectional survey design method forms the respondents. Descriptive survey research design and mixed research approach was employed; Data were gathered from 114 randomly selected respondentst. The data analysis was explained by descriptive statistics and Binary regression model. The qualitative data analyze by words, narrative and the quantitative data were analyzed by frequency tables, percentage. The research showed that 79.8% of respondents were responded the implement level of indigenous physical land management practices where as 20.2 % of the respondents also responded the implementation level of introduce physical land management practices in the study area. And 75 .4 % of farmers respondents revals that awareness on introduced physical land management practices whereas 24.6 % of farmers respondents also revals that had not the awareness of introduce physical land management practices in the study area. The major diterminat factors were farm size, topography, distance of farm land and development agent experts. These result shown that Binary regression model reveal that large farm size had positive impact on introduce physical land management practices; topography had negative relation introduce physical land management practice; the development agents had negative significant influence on introduce physical land; distance from farm land also had a positive significant value of on introduce physical land management. Other remaining factors social demographic factors had direct and indirect significant value forintroduce physical land management practices. The study concludes that in making interventions in physical land management practices, there should be active participation of local stakeholders. This helps to integrate indigenous land management practices and the new techniques and enhance easy adoption and sustainable use of effective introduced practices.

Key word: Introduce physical land management practice, farmer perception and determinat factors

List of ACRONYMS

ARSADB	Amahara regional state of agricultural development Bureau
DAE	*Development Agent expert*
FGD	*Focused Group Discussion*
KII	*Key informant Interview*
IMP	*land management practice.*
INPLMP	*Introduce physical land management practice*
JDADP	*Jabitehnan District Administration Development Plane*
JWARDO	*Jabitehnan woreda Agricultural and Rural Development Office*
PLMP	*Physical land management practices*
NARO	*National agricultural research organization*
NILUPF	*National Integrated Land Use Policy Framework*
MARDE	*Ministry of Agriculture and Rural Development, Ethiopia*
UDPI	*Urban development planning and institute*

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CHAPTER ONE

1. INTRODUCTION

1.1. Background of the Study

The broad concept of land management practices refers to activities on the ground that uses appropriate technologies for the improvement or maintenance of productive capacity of the land. This includes activities such as soil and water conservation, soil fertility management and controlled-grazing.Thus sustainable land management approach emphasizes finding economically viable, socially acceptable and ecologically sound solutions at a local level, which could promote participatory land management practices to deal with land degradation.By (Hurni, 2000 and Yikal, 2007). To emphasis is given to the use of appropriate technologies. And by (MoARD, 2010) to state that land management practice in Ethiopia is not a recent experience; rather it gone back to ancient times. Since 400 years ago rural societies from different parts of Ethiopia stayed in practicing different indigenous land management practices traditionally, but it was before four decades ago that advanced land management technologies had been introduced in the country.and also by Tesfaye, 2003; Wegayehun study about the land management in Ethiopian has evolved into various farming systems with different levels of intensification. Farmers could have enough knowledge about their local environment to be effectively managing natural resource sustainably. Even though most literature state that typical people could manage the environments where they have exist for the future.

Land degradation has been the critical challenge for Sub-Saharan African (SSA) countries; the causes of land degradation are complex and vary from place to place. The major drivers of land degradation are generally grouped into two: proximate and underlying causes. The proximate causes are more or less natural factors such as biophysical conditions, topographic and climatic conditions, and inappropriate land management practices, whereas the underlying factors are mostly anthropogenic, which include population growth, land tenure, and other socio economic and policy related factors. Noted, that African countries are caught up in a worsening spiral of expanding population size, diminishing reserves, intensifying under development and continuing global environmental degradation (Eswaran *etal*, 2001).

Land degradation in most developing countries, in particular, agricultural productivity showed a dramatic decline (Reynolds and Stafford-Smith, 2002; D'Odorico and Ravi, 2016) and reached the level beyond the subsistence requirement of a household (Abalu, 2002); has declined (Lal, 1997, 2001, 2004, 2007, 2013, 2015); 50% the soil erosion and desertification in Africa (Dregne, 1990).). So Ethiopia is one of the countries in the African continent with highest agricultural potential. Its natural resources base is the foundation of any economic development, food security and other basic necessities of its people.

More than 90% of Ethiopian population lives in the highlands with 93% cultivated land, 75% livestock and accounts over 90% of the country' economic activity (Belete et al., 1991; Bezu and Holden, 2014; Hawando, 2000; Bielli et al., 2001; Berry, 2003; Mesene, 2017).Land degradation is seriously threatening the economic and social development of the country as a whole (Hawando, 2000). The problem manifests itself in the form of soil (Teferi, 1999; Omar *et al*., 2013; Gashaw *et al*., 2014).

Low agricultural productivity, poverty and land degradation are critical and closely related problems in the Ethiopian highlands (Pender & Gebremedhin, 2007). Unfortunately, plenty of evidence these problems are getting worse in many parts of the country, particularly in the highlands (Pender et al., 2001).

In most part of Ethiopia, the dependency on farming is extremely high, with 90% of the population being totally dependent on agriculture. Farm productivity is a low result of lack of agricultural inputs, outdated farming methods, deforestation, over grazing, soil erosion, wide spread land degradation, uncertain land tenure and recurrent droughts, all in combination with high population pressure (Ministry of agriculture and Rural Development, Ethiopia, 2005). The majority of the population of Ethiopia consists of farmers and they reside in rural areas and whose life is almost entirely dependent on agriculture. As result, Land is the most important limited natural resource that makes up the fundamental resource base in any agricultural production system; hence it needs to be managed effectively for the creation of wealth in many societies (Stein, et al, 2009).more or less, some of indigenous soil conservation measures are ill-designed and may aggravate soil erosion unless they are linked with modern measures (Michael, 2002). Although, many researcher were find out the land management practices within biophysical components of introduce part and also indigenous mecnhaism in litrarlly view different but not modification with ite implement way. Still this subject matter needs further

study going on processing reserach. Moreover, there was limited research particularly on introduce physical land management practices in the study area. For instance the study was very crucial work for researcher Therefore, the study was conducted among one of west Gojam zone boundary woreda. The mainly assessing the level of introduced physical land management practices: the case of in Jabitehnan woreda, Amahara region, North Ethiopia.

1.2. Statement of the Problem

Given the very high population growth rate and continued degradation of natural resources, theopportunity to increase production through area expansion is very limited in Ethiopia. The greatest potential for increasing agricultural productivity is likely to come from increasing yields through efficient and widespread application of improved agricultural inputs, improved land management practices and related technologies (Kidane, 2001). Low agricultural productivity, poverty and land degradation are critical and closely related problems in the Ethiopian highlands. The regional development strategy of conservation-based Agricultural Development –Led Industrialization focuses on promoting conservation of natural resources through community and individual participation and improvement of agricultural productivity and welfare through a broader program of investment in infrastructure, agricultural extension, education, and other services (Pender *etal*., 2004).

In Ethiopia, the heavy dependence of people's livelihoods on agriculture and inappropriate use of natural resources resulted in fast and vast land degradation by (Tsegaye, 2006). Notwithstanding the introduction of modern practices over the last forty years, indigenous land managementpractices have remained the major feature of Ethiopia's agriculture.

Sustainable land management needs active participation and co-operation between the farmers and the modern experts. It could be achieved through integration of indigenous practices with modern measures. However, in most parts of North West high lands there is miss-link of the practices in the process of bringing sustainable land management by (Yilkal, 2007). Illustrate that active involvement of land users farmers bring to sustainable land management practices and hince for intgertion parecel of land.

The effectiveness of the introduced sustainable land management practices on farmlands has been challenged by many factors such as inappropriate implementation approaches, too much focus on technical solutions, too little focus on addressing the proximate and underlying causes

of land degradations, and poor extension systems by (Adimassu et al. 2016; Adimassu and Kessler 2012; Kassie 2009; Bewket 2007; Bekele 2003). Stated that use of effective introduce knowledge physical land management practices delay to inproper measurement use of methods. Additional contributors to the ineffectiveness in terms of attaining the required results include top-down planning methodology, lack of community input, and low implementation capacity at local levels by (Tongul and Hobson 2013).

Among the natural resource, soil is the most precious and limited resource. This is true especially for developing countries like Ethiopia where the economy is totally depends on agriculture. The fact that 55% of the GDP, 90% of the employment and 60% of the foreign revenue of the country depend on agriculture often shows the economic importance of the agricultural sector (CSA, 2009).

Increasing population pressure and low agricultural productivity, Ethiopia has become increasingly dependent on food aid. In most parts of the densely populated highlands, cereal yields on average less than 1 metric ton/ ha by (Pender and Gebremedhin, 2007) factors of proper utilize land, Furthermore, due to long historic agricultural practices and lack of appropriate soil management practices, a number of agricultural lands, forest area, range lands, sloppy areas and grazing lands are seriously damaged. Thus over cultivation, overgrazing, deforestation, rapid expansions of settlement and over exploitation of resources are the major problems which have direct influence on excessive soil losses in the area by (Abyio.A;Yirgu.T;Lailago.A,2018) deails with the indigenous knowledge physical land mangament practices have good role to play if it is properly linked with the science-based knowledge. It assists to maintain sustainable land management in the area. Nevertheless, there is a general feeling that most of the modern land management measures that are adopted in the country area are not making good use of indigenous practices by (Yohannes, 1999) exprise to Land degradation in Ethiopia is triggered by complex processes and factors and also by (Fistum, *et al*., 1999, Lakew *et al*., 2000; Bezuayehu *et al*., 2002; Aune *et al*., 2003). Discsion In Ethiopia, a significant number of studied on land degradation and determinants of land management practices in different parts of the country. These mainly focus on nature of land degradation, traditional farmers' land management practices, soil and water conservation by government and other actors, farmers' perception on soil fertility change and on causes of land degradation by

(Aklilu, 2006; Habtamu, 2006; Eyasu, 2002; Kfele, 2016; Yohannes, 1999; Pender & Berhanu, 2008) were studied about land degraded and factors of land management practices in different scope. More or less the of researchers were identify either indigenous or introduce land management practices. for instance Ayau, 2016; Kifle, 2016; Kebede.Y, Karri.B, and Buga.Y, 2018; Getahun, 2016; NARO, 2007; Desta Damema, 2012 and Bizuyehu, 2014; Adimew, 2014. Stated that land management practices is ongoing process which needs a further research issue and assess the problems of land management practices in variety place. Moreover land degradation in Ethiopia is triggered by complex processes and factors by (Fistum, *et al*., 1999, Pender *et al*., 2004, Lakew *et al*., 2000; Bezuayehu *et al*., 2002; Aune *et al*., 2003). Stated Land management practices are determined by many factors operating at different scales.

Although many researchers conducted on indigenous land management practices, But there is limited on the introduce physical land management practices in the study. The study revals that the impmentation level of introduce and indigenous physical land management practices, perception of farmers on introduce physical land management practices and the determinate factors on introduce physical land managmenet practices.Therefore, to emphasis the pressure of the introduce physical land management practices and to minimaize existing problems in the woreda.

1.3. Objective of the Study

1.3.1. General Objective

The general objective of this study was assessing the level of introduce physical land management practices: the case of Jabitehnan woreda.

1.3.2. Specific Objectives

In line with this general objective, the study was conducted to address the following specific objectives:

- ✓ To identify the implementation level of introduced and indigenous physical land management practices.
- ✓ To assess farmers' perception on introduced physical land management practice.
- ✓ To explore the determinant factors of introduce physical land management practice.

1.4. Research Questions

The study will answers the following basic research questions

1. What are the implementation level of introduce and indigenous physical land management practices?
2. How farmers' perception introduced physical land management practices?
3. What are the diterminat factors affecting introduces physical land management practices?

1.5. Scope of the Study

Currently, assessing the level of introduce physical land management practices were provided to Amhara national regional state in Jabitehnan woreda. The woreda was very vast and organize at about 39 rural kebeles However; the study was not confined the whole part of woreda due to time limited and financial resource and also with not the available human and natural condition for potential would have needed. The finding of the study was extending to other kebeles, since the study kebeles had expected to the representative of the entire place. Therefore, study was condacted on assessing the level of introduce physical land management practices.

1.6. Significance of the Study

This study focused on the level of introduce physical land management practices with a particular emphasis of land practices which is little assessing issue within previously conducted studies on the area of introduce land management practices. Therefore this study may be helpful for agricultural development office by providing updated information about the effectiveness of introduce physical land management practices methods to improve land productivity; avoid the post soil erosion, runoff water. A detailed look at the effectiveness of introduces physical land management practices method could help to make an indication on the strengths of implementer agents. It might help the institution to respond to the land users' desire and it would also enhance the possibilities of the weak land users to participate in the introduce physical land management programs. To this end, understanding level of implementation with introduce, farmers' perceptions on introduce physical land management practices and identify determinants factors were practices plays a leading role.

1.7 working definition of Terms and Conceptual framework

Land: Land is an area of the earth's surface embracing the biosphere, the atmosphere and the lithosphere resources that occur above and below the surface of the earth. It can also be defined as a resource base of a country that provides access to any planned and not properly planned development and service.

Land management:-Land management refers to soil conservation and fertileity improvement activities. Soil conservation, soil fertility management, agricultural, controlled-grazing and several others are typical examples of land management practices.

Practice*:* refers to the act of continually doing something in order to get better at it.

Modern Land Management Practices; Modern land management practices are studied and identified by universities research institutions and other organizations which are introduced to local farmers in the process of top down approach.

Waterways: are needed to conduct runoff safely from hill slopes to valley bottoms, where it can join stream or river.

Cut-off drain: a graded channel with a supportive ridge or bank on the lower side. It is constructed across a slope and designed to intercept surface runoff and convey it safely to an outlet or waterway.

Terrace: involve a more or less permanent change in slope profile, the steeper the slope, the more needs the drainage system to be supported by terraces in order to reduce slope length and slope gradient. A terrace usually contains a drainage ditch and a dam of low height.

Dam check: blockage of water course or excavation at a low spot of land to collect Water for various purposes

Indigenous knowledge : The term indigenous knowledge (IK) is used to distinguish knowledge developed by a given community over several generations as opposed to the scientific knowledge (Herweg, 2002: 679; Kolawole,2001: 4; Ajibade 2003: 99-100; Tripathi and Bhattarya, 2004: 3); local people knowledge, skills and technologies in land management and related areas.

Perception: people grown up in a certain physical and social environment and through socialization processes become aware of certain issues in their environment. Such awareness of phenomena takes certain shapes in people's minds. This involves the transformation of own experience into certain image. This is called perception (Gutu *et al*., 2003). Van den Ban and

Hawkins, (1998) defined perception as a process by which we receive information or stimuli from our environment and transform it into psychological awareness. Through their senses, farmers receive and gather stimuli that indicate the fertility status of their farmlands are degraded or not whether they are environmentally at risk (Vanclay and Lawrence, 1994; Gutu *et al*.2003).

1.8. Organization of the Thesis

The thesis is organized into five chapters. In the first chapter one, we have presented background and statements of the problem and objectives of the study. The Second Chapter deals with the review of theoretical and empirical literatures relevant to the major theme of the study. Third the chapter presents the study area, survey methods, and data analysis tools and formulated for testing. The four chapter present results of the study and discusses the results by giving due emphasis on purpose of the research objectives. The final part presents summary, conclusions and recommendations.

CHAPTER TWO

2. REVIEW OF RELATED LITERATURE

This chapter selectively reviewed the concepts and theoretical perspectives related to the main themes of the identification. The emphasis of the chapter is to give a general impression on the situation of land resource degradation. The chapter started by clarifying the concept of land degradation and cause in the next section as an entry point based up on alternative definitions of word and terms that forms the context of the study. Following the discussion of the concepts of land, a synthesis of the conceptual frameworks of physical land management practices , introduce physical land management practices, indigenous land management practices, perception of farmers on introduce physical land management practices the next section discuss empirical studied on the determinants of introduce physical land management practices. These include socio-demography characteristics, cultural and physical factors of introduced physical land management practices on the basis of the insights gained from literature review.

2.1 Conceptual frame work

A conceptual framework: was an analytical tool with several variations and contexts. It is used to make conceptual distinctions and organized ideas. Strong conceptual frameworks capture something real and do this in a way that was easy to remember and apply. According to, this conceptual framework identified issues related to implement level of introduce physical land management practice, farmers perception on introduce physical land management practices and the deteriminat factors of introduce physical land management practices were reviewed.

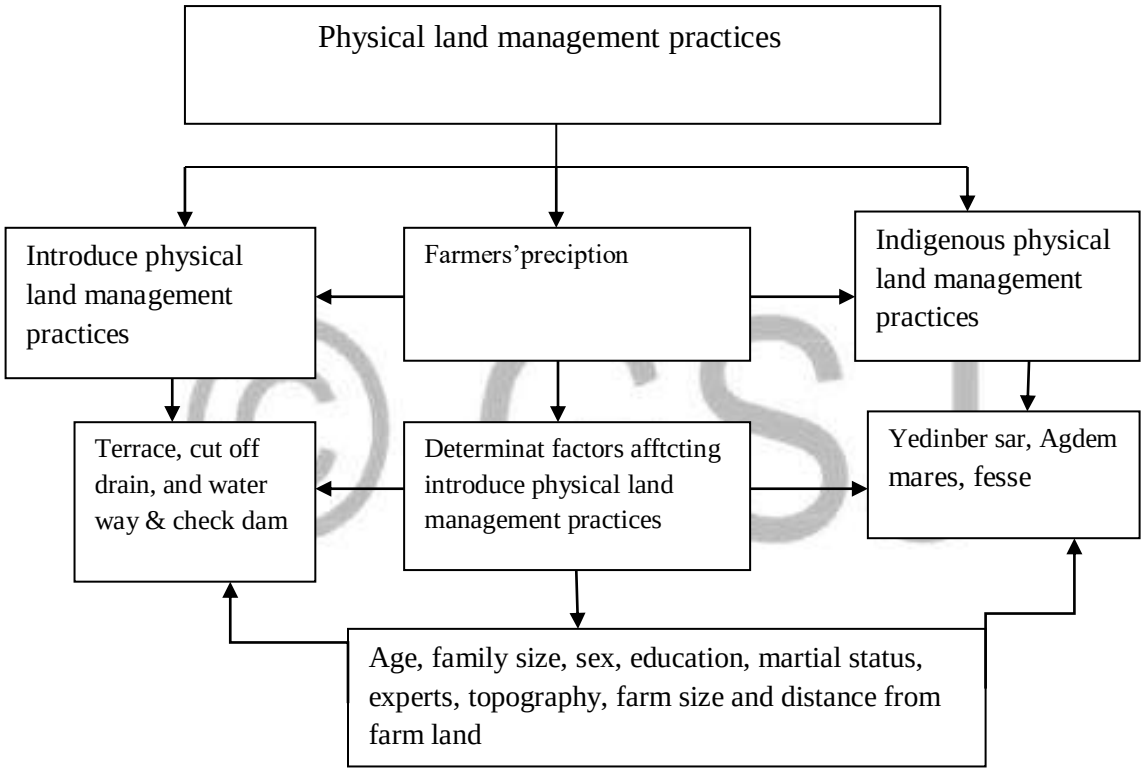

Figure .1 Conceptual framework the study area
Source: (construction own developed)

2.2. Land Degradation

Land degradation can be remaining an important global problem concern because of its adverse impact on agricultural productivity, food security and the quality of the environment. the land degradation in most developing countries, agricultural productivity reached the level beyond the subsistence requirement of a household Land degradation had created serious Limitation to economic development and food security in several developing countries, particularly in areas

where population densities are high like Ethiopia. The level of degradation in many sub sahara African, including Ethiopia, is even more severe. Besides, addressing the proximate and underlying causes of the prevailing land degradation problems remains a critical policy challenge for Ethiopia since its economy enormously relies on subsistence agriculture. In response to land degradation problems smallholder farmers use a wide range of resources management practices and production strategies specific to their agro-ecology to minimize risk, cope with change and shocks, and manage the environment they operate in Generally speaking the land degeradation stated by (Anteneh,2010;Amsalu,de Graaff,2006;FAO,2011;IIRR,1998,Benine et al., 2003)

2.3. Causes of land Degradation

Land degradation caused severe food shortages and famine in 1973 and 1984. Because most people in Ethiopia depend on agriculture for their livelihood, the problem of land degradation requires urgent consideration (T.Grima, 2001). Headworth and Steines (2003) defined land degradation as the loss of utility or potential of the land through the reduction or damage of physical, socio cultural or economic feature and Reduction of ecosystem diversity.

The direct causes of land degradation in Ethiopia are the expansion of annual crop cultivation into steep lands without adequate investments measures to arrest loss of soil and water, erratic and erosive rainfall patterns, declining use of fallow, limited recycling of dung and crop residues to the soil, limited application of external sources of plant nutrients, deforestation and overgrazing (Markos, 1997; MoARD & WB, 2007).

Socio-economic and institutional factors are the underlying causes that affect land degradation through their impacts on farmers' decisions with respect to land use and land management practices. These factors include population pressure, poverty, the high costs of and limited access to agricultural inputs and credit, the low profitability of agricultural production, fragmented landholdings, short time planning horizons, and lack of information about appropriate alternative technologies for farmers by (Fitsum et al., 1999; Lakew et al., 2000; Hoben, 2001; Bezuayehu et al., 2002). Stated that the main cause of land degeration and its impact the soci economic situation human beings.

In addition, absence of a comprehensive land use and administration policy, proclamations, laws, regulations and master land use plans developed in a participatory way at federal, regional, and community levels are the major factors that have contributed to the unchecked land degradation

in the country. Land degradation is advancing at an alarming rate in Sub-Saharan Africa (SSA), particularly in the form of desertification in dry land areas, soil erosion and deforestation in hillsides, and loss of soil fertility in many cropped areas. The degradation of fragile dry lands and hill side areas is particularly worrying because it is often irreversible, or can be only reversed at high cost. While natural forces such as climate change, drought, floods and geological process contributed to land degradation, the most important factor in Sub Sahara Africa is human activity. The key driving force is thought to be a nexus of poverty, rapid population growth, and inadequate progress in increasing crop yields by (Knox et al., 1998; ILRI, 2003). Stated the result of land degradation on land and humans aspect, Whereas the land degradation is the result of complex interaction between physical, biological, socioeconomic, and political issue of local and national or global contexts by (Taffa, 2000). Line with this land degradeation infelence on biophysical, social, economical and poltical condition exist.

2.3.1 Physical factors

Topography: The topography of farmland may also determine the use of sustainable land management practices. The existence of farmland with the degradation and vulnerability to degradation has its own role to implement sustainable land management practices, which means that farmers who cultivate on sloppy and undulating lands are expected to be more conscious of information on sustainable land management practices (Babalolaet al., 2013). Stated that topography one of physical factors that are infelence land manage practice.

Steep Slope: the other important physical factor determining vulnerability of soils to erosion is the slope gradient. Particularly, the steep slopes encourage erosion by increasing the volume and the velocity of the runoff and by encouraging the down slope movement of soils due to tillage. When run off is rapid on steep slopes and hence only a limited proportion of the rainwater can infiltrate into the soil, whereas on gentler slopes the slower flow on the surface allows percolation of a large proportion by (Belay, 2002.) report that steep slope the factors of integrated physical land management practices rather than gentle slope.

Farmers having Steep slope land have the probability of practicing sustainable land management practices when the farmland of the farmer is very stepper, they are very inclined to practice land management practices in order to protect the soil from erosion and to improve their production output by (Motuma, 2017) stated that steep slope land more recmmenadtion of integered physical

land management practices. This implies the problem of physical land management will have more rapid and potentially more damaging consequences on steep slopes, than would be the case on gentler slopes. This implies the problem of physical land management will have more rapid and potentially more damaging consequences on steep slopes, than would be the case on gentler slopes.

2.3.2. Human factors

Population Pressure: the prime factor that affects land resource condition is believed to be population growth. Human population in Ethiopia is increasing at an alarmingly. The same is true in the northwestern highlands where the population is growing at faster rate. This creates pressure on land resource. This in turn leads to decline in the productive capacity of soil resources, which is necessary to sustain the population. The impact of population pressure on land is reflected in the increasing man-land ratio (which results frequent land redistribution), deforestation, expansion of croplands to marginal areas, continuous cultivation of croplands (decrease in the number of fallow years), and overgrazing by (Gete, 2000.) stated that population pressure the human factors that over utilize of land this result for land degraded means.

Deforestation: the need to expand crop or grazing land mainly through deforestation leads to land degradation. Farmers used to clear natural vegetation in order to get cropland for crop cultivation and cope up with the growing population's demand for food and cultivated land. This situation, therefore, aggravates the land degradation problem and causes high loss of soil productivity. In addition, population growth increases the demand for fuel woods, which in turn leads to the destruction of forests as well as increase in the use of crop residues and dung for fuel rather than as a source of organic fertilizer to improve the already degraded or poor soils of the region by (Michael, 2002.) also stated that human factors that are deforestion case land degradation on crop land, grazing land and its loss soil productivity.

2.4. Land Degradation in Ethiopia

Ethiopia is one of the countries in sub-Saharan Africa that is well endowed in terms of its natural resources including biodiversity, and particularly its agricultural biodiversity. Its location in the tropics combined with wide altitudinal variations allows the country to enjoy both temperate and tropical climates and grow a very wide range of crops. This gives a wealth of biophysical

resources including rich biodiversity, relatively fertile soils, and good fresh water resources (Gete et al., 2006). Although the country is endowed with an enormous land resource potential, it has been affected by multifaceted environmental problems including land degradation and declining biodiversity by (Sisay and Tesfaye, 2003).

The major drivers of land degradation in Ethiopia include land shortage and lack of alternative livelihoods (induced by high population growth), forest clearance and high removal of vegetation cover, unsustainable cultivation practices, and over grazing (FAO, 2011)

In recent years, many research studies have been conducted on land degradation in Ethiopia, specifically in the highlands by (Mesfin, 1992; Yeraswork, 2000; Lakew et al., 2000; Woldeamlak, 2003; Mahmud & Pender, 2005; Aklilu, 2006; MoARD sustainable land management Secretariat, 2008).Land degradation in most developing countries, in particular, agricultural productivity showed a Dramatic decline (Reynolds and Stafford-Smith, 2002; D'Odorico and Ravi, 2016). Stated that land degeradation were the problems of integrated indigenous knowledge and introduce knowledge physical land management practices at different perspective.

2.5. Land Management practices

Poor land and water management practices and lack of effective planning and implementation approaches for soil conservation are responsible for strong environmental impact and major economic losses from decreased agricultural production and from off-site effects on infrastructures and water quality by sedimentation process by (Yihenew et al., 2012; Pravat et al., 2015).State that lack of planning and implemention was problems of land managble practices.The strategy of reducing risks by planting several species and crop varieties can stabilize yields over a long term and maximize returns with low level of technology and limited resources. Besides, for effective nutrient management and sustainable cropping, minimize soil erosion and leaching, recycling organic nutrients, compensating nutrient loss and selecting adopted and efficient species are the most generic farmland management practices whereas by (World Bank, 2008.) stated also The composting of vegetables and the use of crop residues and other organic fertilizers is the other efficient way to conserve farm nutrients and enable farmers to redistribute the nutrient-rich compost to fields.

2.6. Land Management Practice in Ethiopia

In Ethiopia, since the 1970s, considerable efforts have been made to reverse the problem of land degradation. What were once considered to be sustainable land management practices such as soil and water conservation, soil fertility management, controlled-grazing and other land management practices were introduced. However, the impact of those efforts did not curb the impact of land degradation in a meaningful and sustainable manner. Various reasons are often given for the lack of success. Among these the most commonly cited factors include failure to consider introduce land management practices, high initial costs which are not affordable to poor farmers and also trying to apply uniform techniques in different agro ecological regions by (Aklilu, 2006) stated that the introduced knowledge of land mangment practices establish until 1970s basically for food staff and to improve by different mechanism to bring the sustainable land management practices.

Traditionally through time, farmers have developed different soil conservation and land management practices of their own. With these practices, farmers have been able to sustain their production for centuries. Even up to now, it has been acknowledged that these technologies, which include ploughing of narrow ditches on sloping fields to control run-off, farmland terraces, traditional ditches and furrows, contour ploughing, fallowing, crop rotation, farmyard manure and agro forestry continue to play a significant role in the production of subsistence agriculture whereas by (Betru, 2003) stated the indigenous knowledge of land management practices developed through time perspectives by typical land users.

2.7 Physical land management practices

Farmers used indigenous physical land management practices starting from the ancient year which was transfer from generation to generation with little documentation. Regarding to physical land management practices farmers. Use different practice to reduce soil erosion and increase production. Physical land management does not achieve its intended goal in the anticipated manner due to lack of introduce measures and depth awareness of the community towards the benefit and effectiveness of different physical land management on the communal land as explained by participants. According to by Hurni (2000) agrue that the ancient farmers staring to the indegious physical land mangment practices until the introduce one started but now without active participation of farmers, it is impossible to minimize the problem of soil erosion.

2.8 Indigenous land management practices

Despite the terms and growing indigenous knowledge (IK) is used to distinguish knowledge developed by a given community over several generations as opposed to the scientific knowledge by (Herweg, 2002: 679; Kolawole, 2001: 4; Ajibade 2003: 99-100; Tripathi and Bhattarya, 2004: 3). IK is an institutionalized knowledge that passes from one generation to another and develops within a certain culture or ethnic group and strives to meet subsistence goals in a particular ecological setting by (Ajibade, 2003: 99).

The importance of Indigenous Knowledge [IK] in sustainable ecosystem management has been well-recognized and it is now gaining increasing attention by (Warren and Rajasekaran 1993: 8; Kolawole 2001: 4; Samal *et al,* 2010: 140). The gap between scientific and indigenous knowledge is declining as scientists and indigenous people are collaborating in many parts of the world (Reijntjes 2004: 41).

IK plays an important role in sustainable management of ecosystems and can also have a role in addressing problems of global concern (Tripathi and Bhattarya, 2004: 2). Indigenous people have extensive knowledge in managing landscapes (Mathiui and Kariuki, 2007: 536) with their own land management experimentation making them more innovative (Reijntjes 2004: 42).

In Ethiopia, there are numerous different traditional plowing systems, which are characterized by a high adaptation to the local ecological conditions (soil, rainfall, altitude, etc.) as well as to social circumstances (fasting times, religious taboos). In the beginning of and during the rainy season farmers must always plow along the contour. For some management purposes, it might be necessary to plow up and down, but this practice must strictly be limited to the dry season (Mitiku.H, 2006).

Past research on indigenous knowledge has paid little attention to Africa (Kelbessa, 2005; 17). There is poor record, lack of appreciation of IK and less attention was given to indigenous land management by experts, researchers and policy makers in Ethiopia by (Reij, 1991:12, Mitiku et al, 2006; 26). However, most farmers in Ethiopia are aware of soil related problems and have attitude to conserve land at farm level. Although less attention was given to IK, it has remained an important, yet unnoticed wealth of knowledge for sustainable management of ecosystem. Current day literature uses different definitions of indigenous knowledge with the World Bank broadly defining it as “a complex set of knowledge and technologies existing and developed around specific conditions of populations and communities indigenous to a particular geographic

locality" by (Parrotta and Trosper, 2012) report that Indigenous knowledge systems in traditional Africa have been used by communities to protect natural resources from unsustainable exploitation thereby averting disasters that may have occurred from such exploitation by (National Agricultural Research Organization, 2007) report that about indigenous knowledge includes the complex of practices and decisions made by local people. It is based on experience passed from one generation to the next, but nevertheless, it changes, adapts and assimilates new ideas by (Oudwater & Martin, 2003). Acoordinglty to Failing et al.(2007), define local knowledge as the full variety of insights, observations and beliefs related to a particular decision that do not stem from conventional scientific expertise. Some of the holders of this knowledge are long-time community residents, some are aboriginal people, and some are resource users with specialized knowledge. Indigenous land management practices are simple structures of a short-term nature that could be reshuffled each year to make use of the soil captured above the structure and avoid rodent production (Tsegaye and Bekele, 2010). They are built upon farmers' indigenous knowledge as part of their farming practices that have evolved through the course of time without any outside institutional interventions. These technologies are one of the inherited and transferred from generation to generation (Megersa, 2011).

Due to cost effective, easy to practices and no need more labor, most Ethiopian farmer practices traditional soil conservation measures on their farmlands, while conserving soil these measures may also simultaneously improve soil fertility by (Dessalew, 2011) Stated that the pre dominantly use of land (soil and water) conservation practices by indigenous practices while th introduce one lack on cost effective problems. Indigenous knowledge has been in academic and policy discussion especially in the areas of sustainable development and biodiversity conservation for quite some time by (Nakashima and Roué, 2002). And also explain anwarness of the introduce practice to presrbe the biophysical components of the land. Sustainable land management could be achieved through the increased recognition of the contribution of indigenous practices of the farmers by (Michael, 2002). Report that the indigenous physical land practices have great contribution to sustainable development of the economy.

2.9. Introduce land management Practices

The introduced type of land management technologies refers to the recommended type of structures, which have standard length, width and height. These structures have specific design

requirements and need major investments of labor in construction, often during a single period. In most areas of Ethiopia, new land management technologies were introduced more than two decades ago. During such span of time, the introduced technologies have been under continuous modification, which make it very difficult to trace them back to their origins to compare them with recent development by (Tadesse, 2011) agrue that the use of introduce knowledge of physical land management practices were have its own standard measurement to constracted. The introduced land management technologies in Ethiopia includes soil/stone bunds, terrace, inorganic fertilize, check dam, waterways, cut off drains, area closure and closed gullies, hillside terrace, fanyajuu, organic fertilizer by (Blata, 2010) report that the above activity were exercise constracted in different types of theregion. These technologies are comparatively had long run benefits and importance. However, the hope and desire of the farmers was to get immediate benefits and to increase production from treated lands in order to continue the practical application of the new technology by (Amsalu, 2006) report the use introduce technology were the significant of land production and by Adane (2007) pointed out those farmers have blamed the new technology because of different reason. The complains of the farmers are associated with the following drawbacks: its narrowness for ploughing, losses of the substantial lands out of use, the breeding conditions of rodents and weeds within structure, its difficulty in designing, demands of much labor, encourage for formation of water logging at flat land, solidness at steep slope and artificial water way to form gullies.

Based on the ecological and socioeconomic understanding of the environment and the local farmers and their relationship, Sustainable land management is the need for active participation and co-operation between the farmers and the modern experts by (Michael, 2002) inorder to achived consistency of sustainable land management the enrollment of active partication. Further more introduce physical land management practices limited resrach in ground level of end land users.

2.9.1 Standard measuresment for land management

Based on Amahara regional state of agriculture developemrnt bureau Point out, the most familiar introduces physical land management practices were stated in details. According to Amahara regional state agricultural bureau were anuuced to jabitahnan woreda land character. These standard measurements were not uniformly implment action in term of hetrogenity

topography. So the researcher mainly confined on pre dominantly knows introduce physical land management practices in the study area were:

2.9.1.1. Cut off drain

An is a ditch dug across a slope to collect runoff and divert it to a natural or artificial waterway or to water storage structural, it protects crop land and other land down the slope. One cut off drain on a slope is usually enough, but more can be built on long slopes. These physical conserving soil and water have been their constraints. If not made properly constructed, it could be cause of gully erosion. Therefore, it would have justification of technical standards on farmers problem at farm land were consistently implemented. It should considered as land forms, land use, soil condition, slope, rain off area, catchment area were constructing cut off drain.Average footing area of cut off drain from 60 cm up to 1.40 cm/m.Cut off drain depth from 30cm up to 70cm. Cut off drain header area from 1.2 m up to 2.8 m.It is hard to construct cut off drain on slope steeper than 50% of these were the fundamental issue of cut off drain set up farmers' farmland. The average construction of cut off drain per day work by farmers were $0.7m^3$

2.9.1.2 Waterways

It is natural or drainage channel that leads water down slope. It takes runoff water from cut off drain or graded structure and carries it to rivers and streams or preferable, water storage structures. The width of artificial waterways depends on the steepness of the slope and the amount of runoff in the area. This method practices for woyena dega agro ecology climate zone and the slope range from 3 to 50% of. In short waterways take excess runoff safely down the slope, preventing gully erosion. Even so it requires sikll human power, interst, capital and great motivation the land user of rural community. The landform slope below 10% of it recommends vegetation covers part and also land was above 25% of slope it should construct by stone Construct as parabolic design;The total catchment area below 50 hectors of land;The waterway width and depth could determine, rain off area, catchment area, land use and consider. These standards measurements were apply on farm land using mathematical formula and survey work procedure.

2.9.1.3. Check dams

It is a wall built across the floor of a gully or waterway. It slows down the water flow and tops the gully from getting deeper or wider. It could be made of stone, live or dead branches, metal bars and wooden poles, etc depend on different susceptibility landscape. Mostly useful in small and medium size gullies. There are three main types; wood, stone, gabion/wire cages filled with stones cement. Where to used check dams were applying all agro climate zones and take care on deeply weathered soils or loosely accumulated deposit because they cannot support structures. Maken a set of wooden posts, 5-10cm in diameter and 1.5-2.5 m long .one end of each post to make it easy to hammer into groung.hammer the posts 0.5-1 m apart, at least 60 cm deep into the floor of the gully.The spacing between the posts depens on the heigh of check dam: the higher the dam, the closer the posts. For the double –row check dam, make two rows of post, 50-60 cm beween the rows.Weave thinner braches between the posts to orm a wall.dig the branches 50 cm or mare in to the sides of the gully.gabions are boxes of the wire mesh that are filled stones. The boxes are put in postion then filled with stones; because they are heavy to move when they are full Gabions are tough and last a long time.gabions boxes come in two standards size 2m long *1m wide * 1m high and 2m long *1m wide *0.5m high. dig trench 1m deep in the gully floor. The trench must be be a wide as the gully and should be dug in to the wall to stop water feom eroding around the sides of the dam.Place gabionboxes into the trench, fill them with stones and tie themwith wire.Add another layer of gabions on top to raise the height of the dam. Makes the sides of the dam higher than the middleA Series of stone check dams, above 1 m high and 4 m wide. The dam and the beneath it (design to break the fall of water spilling over the dam) penetrate sides way into the gully well. Runoff flows over the center of the dam; Sediment is deposited behind the dams.all see the illustration are stated Agricltural development bureau ,this scnitific measurement some what not clear by the rural farmers to maintance their farm land. So that there is a gap between the implementation of on ground level. Rather they constracted by mass mobilization system were inoloves each season that is fulire.

2.9.1.4 Terrace

Terrace physical land management activity state that there are two types of terrace mechanism with regareds to slope character. These are level terrace which means that the physical land structural have gentle slope where as graded terrace which are recommded that steep slope of

physical land stractral. Based on this graded terrace dominantly occurs Worich, Dega, moist Deyena dega, wet kolla agro climate zone where as level terrace more practices dry wina dega, sub kola. Though the general land forms slope 3-30% of and also 3- 12% of slope land requires physical land practices. Let as seen the technical standards measurement were list down, The graded terrace standards wereThe average land slope 0.5%- 1% of were selected.The high of level terrace 60cm.Lower terrace foundation area 1-120 meter and the top heading area 30-40 meter.The earth work ditch area from meddle to top side should be wide because of runoff volume increase and it should be 5 meter interval control method were recommend. Level terraces the sub class of terrace method activity which were practices the land has equal height level follows their contour line.

On other hand, level terrace also uses wet agro ecology climate zone area, the run full amount well accessibility and good filtrate soil type, slope from 3-30% of area. From the slope character 3- 12% of land which covers black soil type excise bio life and the consistence of with modern technology procedure methods were apply: The bottom area at least from 1-1.2 meter; height at least 60 cm; the header area of level terrace were 30 cm and length the level terrace also cm 80 meter should considerable for conserve soil practices. Average level terrace work quantity 150 person pre day/ km. this level terrace was corospond to the indigenous knowledge structural land managing.

2.10. Farmers' Perception on introduce land management practices

Different farmers may have different attitudes towards soil conservation. Those attitudes may also affect the selection of soil conservation practices. Sometimes, farmers who have good attitudes also may not practice soil conservation due to the socioeconomic failures (Bandara and Thiruchelvam. 2010).

Perception of farmers towards a new technology is a key precondition for adoption to occur. Other factors that have been shown to determine adoption of agricultural technology include human specific factors, economic factors, technological and institutional factors. Some experts argued that awareness of the existence of soil problem is the first step in the adoption process and is positively correlated with the adoption of soil erosion controlling mechanisms (Ervin and Ervin, 1982) However, (Woldeamlak, 2003). In their study found that in spite of the high level of farmers' perception of soil erosion problems, the level of adoption of conservation structures

was very limited. Thus, perception of erosion problem is not a sufficient condition for adoption of soil conservation practices though it is a necessary one. Practice of traditionally known soil conservation methods tends to be influenced by some factors. For instance, farmers well know the importance of crop residues in enhancing soil fertility. However, crop residues and animal dung is used for fuel energy and other home us.

2.11. Determinant Factors of introduce physical land Management practice

It were becoming increasingly clear especially in the case of Ethiopia that land management practices are a complex issue requiring further investigations as they are influenced by different factor operating at different scales. These factors include government policies, programs, and institutions at many levels. Infrastructure development, agricultural extension, conservation technical assistance programs, land tenure policies, and rural credit and savings programs affect awareness, opportunities, and constraints at the village or households level which may further influence land management by (Pender, Ehui& Place, 2006).

Several natural and anthropogenic factors like misaligned policies and motivations as well as weak enforcement capabilities of policies put hindrances on activities to be practiced to assure sustainable land management by (World Bank, 2008) report stated. Climate and relief of an area have direct and indirect impacts on farmland management. The types and intensity of the management practices to be implemented at a given unit of land depends on the nature of the climate and topography where the farmland is located. Climate and topography affect the types of crops to be produced at a given farmland. For instance, erosion is mainly attributed to the steep slopes, population pressure, deforestation, poor farming methods and vulnerable soils by (Girmay et al., 2008) Explain that human and natural factors influence crop land for instance climate, topography and population perssure direct or indirect affected physical land

2.11.1. Age

The effect of farmer's age can be taken as a composite of the effect of farming experience and planning horizon. While longer experience has a positive effect than young farmers. Also longer planning horizon and hence may invest in conservation.The households' previous experiences may have either positive or negative, and this were likely influence his or her attitudes on adoption of introduced physical land management practices. Besides his or her capacity to earn additional cash income, may increase or decrease with age, age may have a bearing on

investment by (paulos,2002; Fitsum,2003) report that longer age experience hava best use of land practices and also might have use or not the adoption of the introduce one.

2.11.2 Sex

As population structures, Sex and Age are the most important indicators of socio demographic characteristics and the constrbution of economy development for a certain region at large level. although compared with their participation of introduce physical land management practices in study area surevy were males, the direct participation of women in the agricultural practice in general and their agricultural land resource management practice in particular is going to be neglected. This also directly related with an all-comprehensive report by FAO (2010) stated that rural women have only use rights mediated by men particularly in many developing countries.

Being male or female has its own implication to identify factors affecting implementation of sustainable developmemt practices, which indicates that male headed households had the potential to conservbe physical land management practices than Female-headed households by (Motuma, 2007). Introduce physical land management practices activities were almost carried out by male members of the family and female were limited mostly to performing domestic activities by (Benin, 2006).

2.11.3. Education level

Education was one of the basic human needs that all human beings deserve for the proper understanding of social, economic, political and natural environments in which an individual lives. And also education helps farmers to choose and apply appropriate land management practices on their plot of land. The more educated farmers were more likely to used the best and sustain land management practices. And have obtained such knowledge from school and then apply it on their farms compared to the less educated by (Pender et al., 2006).

2.11.4 Farm size

Farmer's having Large farm sizes were expected to practice better land management practice, this was due to farmers perception to large farm size was very high because farmers having large farm size were practiced better land management practice by planning different land management technologies by (Motuma,2017). Some studies reported that farmers with larger farm size have more cash to hire labor to undertake land investments that has direct impact on land management practices by (Pender *et al*., 2004).

2.11.5 Limited facilities for effective extension

Agricultural extension is critical for the growth of agricultural sector. According to Regassa *et, al., (2013*) making the extension services systematic, effective and demand driven is critical challenge in the development of agricultural sector in general and to manage agricultural land in particular. The national agricultural extension system also requires care full analysis of national policy and policy makers directly or indirectly give emphasize to resolve and fulfills facilities needed for extension. Example, limited development agent and application of information technology tools to facilitate the work of extension service in agricultural land management are one of the challenges related with national policy by (Qamar, 2016).

CHAPTER THREE

3. RESEARCH METHODS AND MATERIALS

3.1 description of the study area

3.1.1 Location and population

Jabitehenan Woreda is found in West Gojam Administrative Zone of Amhara National Regional State of North West part of Ethiopia. Geographically the Woreda is located at 10º 68' 11" N latitude and 37º 26' 53" E longitudes and its relative location of Jabitehnan woreda is surrounded by Dembecha and Burie woreda in the South, Dembecha and Degadamot woreda in the East Qurit and Sekela woreda in the North and Burie woreda in the West direction. It was 176km far from North Western part of Bahir Dar, 387 km away from East part of direction Addis Ababa. Jabitehnan Woreda was divided in to 37 rural Kebles and 2 urban Kebeles centered Jabitehnan as an administrative town. The woreda have total area of 116,954 hectares out the total land 65% of gentle slope or plan table, 15 % of mountainous, 5% of valley and finally 15% of up and down. In addition to, the study area with an elevation ranges from 1500-2500m above sea level (UDPI, 2005). And also Jabitehnan woreda has an estimated population of 229,045 of whom 112,554 are Males and 116,491 are Females with the population density of 195 people per km^2,

and among the total estimated population 42,076 are urban while 186,969 are rural inhabitants. From the total woreda population 30,484 live in Mankusa town 01 and Jiga town 02 its covers 16% of but the others lives in rural area and also From the total population 98.98% of Christian and the remaining are other religion followers(CSA, 2011/2012).

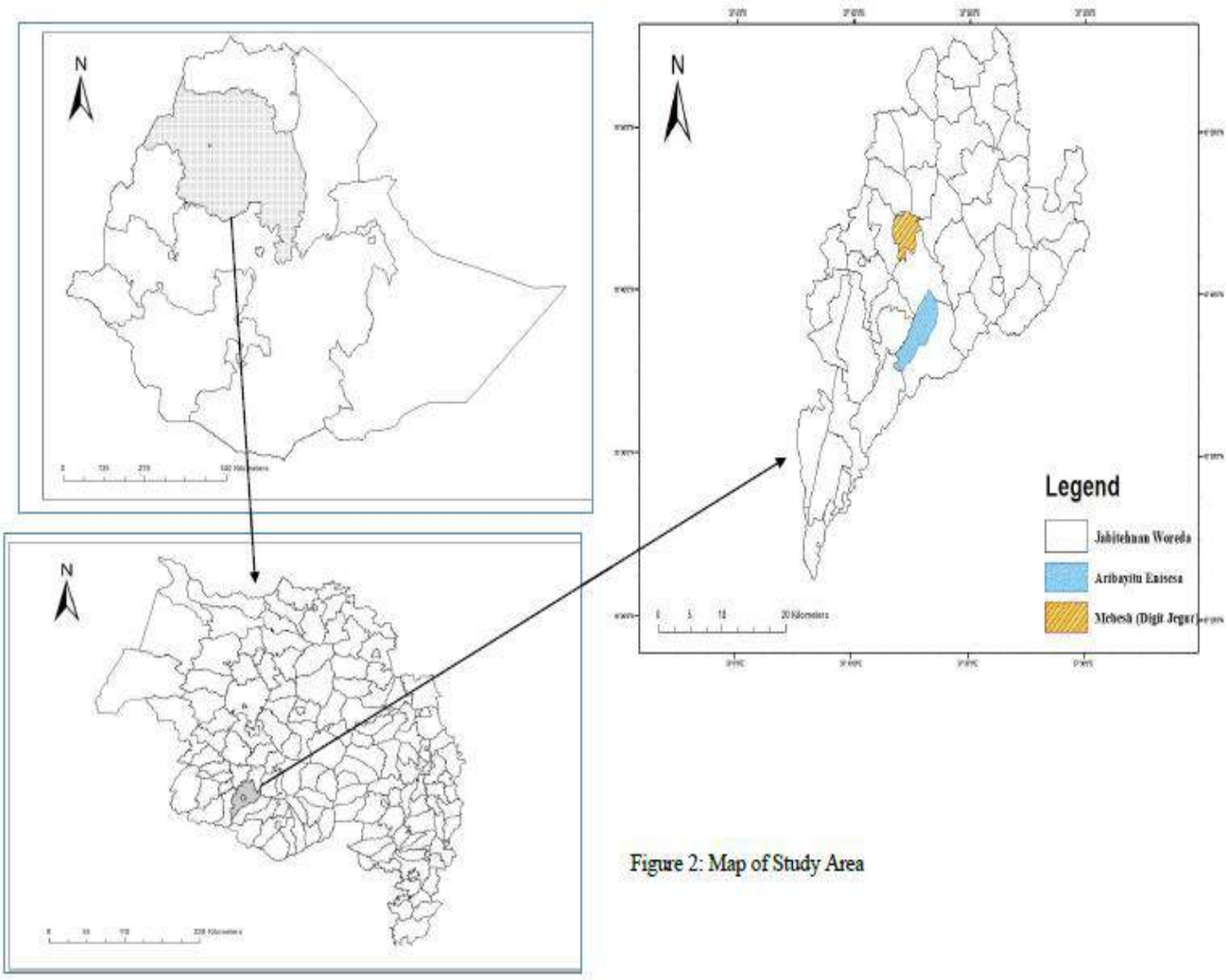

Figure 2: Map of Study Area

Figure 2: Map of study area

3.1.2 Altitude and Climate

Ethiopia has remarkable diverse landscapes, Altitude range from 120 m below sea level (in the Danakil desert) up to 4,620m above sea level (in the Siemien Mountains).the mean annual rainfall from less than 100mm to 2,400mm per year. Day time temperatures range from 2 degree centigrade and 43 degree centigrade. The soils vary in color, texture, fertility and extent of degradation. The two most important climate factors from farmers or development agent's points

of view were temperature (which was determined by the altitude). Even although Ethiopia is located in the tropical zone, the study area was having three types of climatic conditions resulting from its topography. The traditional classification of climate based on altitude and temperature gives the woreda three zones. About 82 % of woreda has Woina Dega climate, (moist highlands with altitude of between 1,500 – 2,300 meter above sea level), 15 % of was wet Kolla with altitude 500 -1,500 meter above sea level and 3 % of Dega climate (temperate highlands with altitude of 2,300 – 3,200 meter above sea level). Nearly 88, 9 and 3 percent of the woreda population live in wonina Dega, Kolla and Dega agro climate zone respectively. The mean annual temperature of the ranges from 15 to 27 degree centigrade and annual rainfall, which ranges from 800 to 2500 mm (UDPI, 2005)

3.1.3 Land use

Jabitehnan Woreda has about 116,931 estimated hectares of land. From the total land, 100,665 hectares is potentially arable land or land that for cultivation; of which 93,509.72 (79.97%) of hectares of land used for cultivation which was characterized by intensive land use system, 10,593.94 (9.06 %) of covered by bush and grass and 5,530.84 (4.73 %) of hectares of land is built up area for different purposes(UDPI,2005).

3.1.4 Forest and wild life

Due to irrational utilization of forest and wild life resources, natural vegetation and wild lives in the woreda are on the verge of extinction. At present remnant vegetation were only found in and around monasteries, twitch yards, along riverbanks, and inaccessible mountain peaks. Moreover, the extensive use of natural forest resulted in a drastic decrease in wildlife. Hence, nowadays it is believed that only common wild animals like monkey, ape, hyena, fox, etc, are found in a small number (UDPI, 2005).

3.1.5 Soil type

In Jabitehinan woreda, there are four major soil based on color, reddish soils (Nitosols group), black soils (Vertisols group), grey brown soils (Luvisols group) and dark brown (cambisols group) from these soil groups more than 80 percent of the total area of the woreda dominantly cover by Nitosols soil type (UDPI, 2005).

3.1.6 Major production of the study Area

The woreda is predominantly agricultural and a large percentage of the population practices mixed farming. Teff, maize, red pepper, wheat, fruit and vegetables are the main crop types and mostly cultivated in the woreda. The majority of the rural inhabitants practiced subsistence farming or a kind of "hand to mouth" tradition. Agricultural labouring is another, very limited source of cash. Agriculture in the area is predominantly rain-fed and is very vulnerable because the distribution of rainfall is uneven and is characterized by late-onset and early cessation. These major crop productions of the study area are Teef, maize, which covers about 37,811 (43.36 %) of hectare of land from the 87205.30 seasonally cultivated lands. The second is corn, which covers 22,270 (25.53 %/) of hectares of land. From the total amount of hectors of land this amount 5600 hectare of land is used for oil seeds, about 694 hectare of land is used for Sugar Cane, Coffee, Chat and Gesho and 56 hectare of land is used for other perennial crops like Orange, Lemon Banana and like. Were covers on the other hand the woreda are 5,341 hectares is used for grazing and 4,056 hectares is covered by forest which found in the southern part of direction. The region has high potential to produce more perennial crops like sugar cane, coffee and other vegetables and fruits. In addition to this, it is possible to develop fishing in the artificial lake (UDPI, 2005).

3.1.7 Crop production and protection

The prime concern of the Jabitehnan woreda administration is to feed its growing population which has now become a major challenge in development issues, as the annual growth of population out-paced the annual growth of food production. To tackle the problem the regional agricultural policy has focused on the development of peasant agriculture due to this significant contribution to the overall development of the regions. Currently the greatest challenge, which faces the region of Amhara in general and the woreda in particular left so many people vulnerable to food storage, which is attributed by the recurrent occurrence of drought in recent years. Even though multifaceted efforts are under way to tackle the challenge, still it is a major concern that needs great attention by the woreda as a whole. Farmers of the woreda follow traditional farming system preceded from his for fathers. Mixed farming system prevails throughout the region, with crop and livestock husbandry being typically practiced within the same poor management system (UDPI, 2005).

3.1.8 Introduction of new technology

Some times what commonly perceived in the introduction of technologies is failure to convince the farmer and create demand ahead of time. The other problem is the poor integration or linkage of research with the agricultural extension. Researches have to have a closer attachment with the extension so as to proceed by incorporating the farmers' problems. The research has also to focus on adoptions prior to releasing new research findings. In order to ensure the benefit of the farmers; its research products have to be also market oriented ones. Generally, even if improvements are being registered the hitherto situation indicates that the productivity of the agricultural sector is very low. This implies that the potentials are not fully exploited. Therefore, the extension system has to be geared towards bringing technological transformation that would enable the individual farmer to have a significant increase in income and escape from poverty, and at the same time promote rapid and sustained economic development (UDPI, 2005).

3.1.9 Agricultural Extension and Training

Agriculture is the dominant economic activities sector of the woreda, about 93 percent of the population is engaged in this sector. The common style of production is a mixed system of crop production and livestock. The major crops grown in the area include teff, barely, maize, millet, beans, pea, chickpea, lentils, etc. Besides to this, different vegetables and fruits especially potato and onion are grown in large quantity. In addition to rain fed or "meher" production, traditional irrigation is practiced in different areas of woreda. Besides to peasant agriculture, there are state farms, namely, upper Birr and lower Birr, which are engaged in crop husbandry, and are currently privatized. There is high population and livestock pressure that lead to over utilization of resources. The existing agricultural practice is non-diversified agriculture and characterized by the utilization of absolute farm implements. Due to this and other various reasons, the sector couldn't play its expected role, even though, Jabitehenan is one of the food surplus woreda in the West Gojjam Zone, large number of households does not fulfill their food requirement. Agricultural extension had been given due attention to disseminate new idea to rural people and as a policy instrument. It uses a model or system to properly manage the knowledge and information flow from the source to the receiver. Farmers and their formal and informal institutions, as part of the main actors in development activity had been addressed in the extension service, although the degree of addressing these actors (farmers, and their

organization) was not as intended. Hence, there is still gap between the extension service given to farmers and the actual situation in rural areas. This gap has brought a negative impact on the outcome of the planned extension program due to the fact that farmers' participation was not taken as a precondition for the success of the extension service. The common extension approach was also known as transfer of technology which means technology was generated somewhere in the research areas and then transferred to farmer by assuming that they will accept it easily. No one was worried whether that technology was matching their need, economic status, social values, perception of their environment, etc. Nowadays, the approach was changed and every concerned institution have begun to think that farmers have knowledge too that could solved their problem, if it is properly understood and applied. Development planners, researchers, extension workers etc., have started to bring farmers at the centre stage to ensure success of any rural development activity (UDPI, 2005).

3.1.10 Cooperatives and Market

In commercial agriculture, the private sector is expected to take a lead to be involved in the business transaction to this effect the government is pursuing and creating favorable environment to accelerate the involvement of the private sector including millions of small farmers. Hence, Cooperatives are essential organizations to enhance bargaining power and was able to benefit the small farmers fully from the market transaction. To strengthen capital and managerial capacity and then to be market oriented organizations cooperatives grew to higher level and established a unions which embrace many kebeles. Nowadays cooperatives are highly promoting rural marketing activities in agricultural inputs and agricultural products. Therefore, given the existing condition, it is crucial to scale up the efforts being made to facilitate commercialization of agriculture in Jabitehenan woreda. Specifically, in this woreda, attempt has to be made to embrace the overwhelming number of small farmers in the agricultural cooperatives, strengthening the capacity of cooperatives, developing market infrastructure, integration of local markets with regional market information system (UDPI, 2005).

3. 2.Reserach approach

This study has employed methodological triangulation where in the qualitative approach was used as the predominant approach and the quantitative research approach as a supplementary

one. To be achieving the research objectives conducted by mixed approach, both qualitative and quantitative methods. Qualitative research was concerned with qualitative phenomenon, i.e., phenomena relating to or involving quality or kind. And the research level processes were, descriptive, discussed, described and analyzed using of qualitative methods. During data collecting program the number of respondents were have selected by purposive sample techniques. And also a qualitative approach were employ to describe the data extracts from focus group discussions, interviews held with development agents or experts and direct observations of the study area were collected by purposive sample method type. Quantitative research could illustrate based on the measurement of quantity or amount; it is applicable to phenomena that can be expressed in terms of quantity. In addition to descriptive statistics such as percentages, mean values, and frequency distributions of the quantitative approaches were employing for summarizing the raw data extracts from household survey questionnaires. The questionnaires formulated carefully to provide answers to the research questions relate to the objective of the study.

3.3 Research Design

This study employed a descriptive cross-sectional study design. The reason behind using this research design was in the study area the data were collected at a point of time from selected sample respondents.

3.4 Data source

To achieve the objectives of this study, both primary and secondary sources of information were consulted from different sources. The primary sources of information for this study were informants, focus group discussants such as the survey farmers of in the woreda, Agricultural development experts, technical comments and woreda leader. The secondary sources of data were generated from different available documents, journals, both published and unpublished materials from web sources, articles from both the local and international sources, different books and literature dealing with the issues of this study.

3.5. Methods of Data Collection

To achieve the final result and discussion the research objectives ,a combination of different qualitative data collection instruments was employed such as, key-informant interviews, focus-group discussions, and different documentary data analyses. Moreover, survey method was employed to generate quantitative data.

3.5.1 Survey Questionnaire

The questionnaire was used as a tool for primary data collection. The questions were provided by including both open-ended and close-ended items and it was designed in accordance to translate the research objectives into specific questions. The questionnaire was included background information about respondents such as sex, age, educational status, marital status, family size. It also helped to assess the respondents' time length of their distance from land users the extent of implement. By using the questionnaire this study could to examine the integration level of physical land management would utilize for the intended purpose. Moreover, both the open-ended and close-ended questions were helpful to minimize the problems land degradation for land users. The questionnaires were administered by the researcher and other four assistant data collectors since the majority of respondents were illiterate. The field survey was conducted with a sample size of 114 purposive selected. In addition to the above-mentioned data collection instruments, documentary analysis from various documented data sources and different available documents, books, thesis, dissertations, and journal articles dealing with the issue under gathering were employed.

3 .5.2 Focus Group Discussions (FGD)

Focus-Group Discussions were employed to generate qualitative data to supplement and substantiate the data that were generated through questionnaires; the method was found useful to generate information concerning the nature of group formation, composition, interaction and nature of a trust; best exercise and factors of implementation of integration level physical land management. For this purpose, the group discussions were conducted with two group discussants (the group have six or eight members). The discussions were conducted in line with the land users farmers the previous group which was formed for their purpose of group. The discussions were conducted by using the list of discussion guiding questions.

3.4.4 Key Informant Interview

The study employed a key-informant interview. This method was important whereby the well-informed informants provide the researcher with depth and detailed information on the specific objectives. The key-informants were respondents in Jabitehnan woreda, who have deep knowledge (as a result of their experience and implement within their farm lands). Mainly the key-informants were drawn from all development agents working in the sample kebeles, Woreda Agricultural and Rural Development Office, woreda Natural Resources Management and kebele survey farmers. Also generating valuable information on the implementation measures for land users and its impact on the consistency of level introduce physical land management practices.

3.5. Sampling Technique

Initial all the 39 rural kebeles in Jabitehnan woreda were classified according to the three agro-ecological regions of the study area – Dega, temperate highland agro-ecology (wina dega) and kolla agro-ecology. One kebele was selected from the highland agro-ecology (wina dega) while other kebele sub kolla agro-ecology using purposive sampling technique. A total of 114 responedents - 34 from the highland and the remaining 80 from sub kolla agro ecologies were selected through the principle of proportional sampling technique and simple randam sampling method were employed. It was also considering the agro ecology climate zone and accessibility of time and financial. Each kebeles selected from Woina Dega and sub kolla in the woreda and it considers as representative of the entire kebeles of the woreda.

3.5.1 Sample Size

To determine the sample size widely used for Kothari (2004) formula accordingly. The sample sizes for respondents were selected by simple randam sampling employed. From each the target population of the respondents' selected area. Then to determine sample size try to calculate in below methods.

$$n = \frac{(Z^2.P.Q.N)}{(e^2(N-1) + Z^2.P.Q)}$$

Where;

n= required sample size
N= is the population size (1423)
Z=is the confidence level at 95%, Z = 1.96
P=Sample proportion (0.03) given from the previous study
Q=1-P
e = the estimated should be 3% of the true level

$$n = \frac{(1.96)^2 (0.03) (1-0.03) (1423)}{(0.03)^2 (1423-1) + (1.96)^2(0.03) (1-0.03)}$$

$$n = \frac{(159)}{(1.4)}$$

$$n = 114$$

This sample size numbers share on each selected kebleles could respersented by proportional sampling methods. by this mathematical formula.

$$n1 \equiv N1*n /N$$

Where: n1= the required sample size from each Kebele
N1=Total number of households in each Kebeles
N= Total number of households in all selected sample Kebeles
n = Total sample size selected from all sample Kebeles

n1= N1*n/N
n1= 424*114/1423
n1= 34
n2= N2*n/N
n2= 999*114/1423
n2= 80

Table 1 sample size of the study area

No	Kebeles	Total households	Sample size	Percentage (%)
1	Mebeshi	424	34	30
2	Arebayitu	999	80	70
Total	2	1,423	114	100

3.6 Methods of Data analysis

The data analysis conducted on both quantitative and qualitative research approaches.The qualitative data were gathering information through; key-informant interviews and focus group discussions,whereas to analyzed qualitatively with careful interpretation of the given data meanings and contents. The data were organized into different features based on the research objectives. The researcher point out the detail notes during the interview sessions in Amharic.

Since all the data were collected using local language (Amharic), it was directly translated into English by the researcher with more emphasis to maintain the originality of the data while translating it into English. Concerning qualitative data presented, by descriptive through words, narrative and explanatory was employed. The quantitative data were generated through the questionnaire, by using descriptive statistics such as frequency and percentage distribution tables, and it is supported by qualitative interpretation. When one or more of the explanatory variables in a regression model were binary, we confined to represent them as dummy variables and using by binary regression model and check the relationship between the depenanet and independat variables. Finally, data analysis tried to link the findings of this study to other researchers to show the extent to which the findings in this study reflect, or differ from the findings of others.

3.7 Ethical Considerations

In this study, the following ethical issues were taken into account in all stages of the research process. Concerning ethical issues in the study participant, the initial stages of data collection procedure were benging by a report with respondents and other concerned bodies by asking their willingness and cooperation to give the required information after announcing the objective, purpose, and significance of the study. All things in the filed were performing based on their informed consent of the respondents. Furthermore, great care was takening when sharing information from other researchers and other literature.

3.8 Limitations and Challenges of the Study

In this study, all of the respondents were active when the data collection. Hence, some of the respondents they were responed your finally result has a significant value for rural household farmers and like.The study limitation is time and financial resource limitations have forced the researcher to limit the study to only two of both 39 woredas of the Amahara Region. Finally, it is important to note that because of the fact that the land production and practices systems in the region were pursued within diversified agro-ecological, socio-economic, cultural, and physical. Its results could not be generalized to the zonal or regional level. However, the recommendations and policy implications of the study was used for other areas of similar contexts and as a basis for further studies. One of the challenges in this study was the bureaucratic procedures of the institution, got

relavnet information from agricultural development office and kebeles development agent experts also it was difficult transport services.

CHAPTER FOUR

4. DATA PRESENTION AND ANALYSIS

This chapter presents results of the study and discusses the results by giving due emphasis onpurpose of the research objectives. For the sake of clarity and case of understanding, the descriptive results and frequency distribute. The primary focus of this study was to assess the level of introduces physical land management practices: the case of Jabitehnan woreda, Amahara Region, Ethiopia. This chapter is describe into four sub sections, mainly the first sub section were presents the soci demographics of the sample respondents in reference to physical land management practices; the second sub section presents the implementation level of introduce and indigenous physical land management practices; the third sub section presents perception of farmers on introduce physical land management practices and the last sub sectiona presents the diterminat factors of the level of introduce physical land management practices were presented by the researcher. To this effect, the study was employed methodological triangulation i.e. mixed methods research approach wherein the quanitative result approach were represent by qualitative approach. The informants for the qualitative methods (such as Key informant interview and FGDs) were selected purposively. Total number sample surevy 114 respondents. These respondents were employed by proportional sampling techniques. Further more, Questionnaires, key informant interviews and focus group discussions (FGD) were employed as the major respresnting part. And also the chapter presents the socio-demographic respondents were illustrate in details. In addation to the research were identify the relationship between independent and dependent variables shown by using the binary regression model.

4. *1*The socio-demographic Respondents

The socio-demographic characteristics of household head includes age, sex, martial status family size, education were assess. Thus repondenent of sample respondents' revals that introduce physical land management practices in the study woreda.

4.1.1 Age respondents

Age is one of the the scoi demography characterstics. Accordingly, the different age groups let as represented the respondents in the study are in table 4.1 precntage distrution of respondents based on age.

Number of respondents on age	Frequency	Percent
<25	2	1.8
26-35	25	21.9
36-45	47	41.2
46-55	36	31.6
>55	4	3.5
Total	114	100.0

(Source: suvery data, 2020)

From the above table indicats that 47(41.2%) of respondents under 36-45 age groups were belived that age was shown level of introduce physical land management,36(31.6%) of respondents under 45-55 age groups also were responed surevy data and also 25(21.9)of respondents under 26-35 age group ; 4(3.5%)of respondent under above 55 age groups respectively. This conclude that 36-45 ages groups were dominate responded on condacted the study aera.

4.1.2 Sex of respondents

Survey result of the study shows that out of the total of sample respondents, 96(84.2%) of male were farmers. According to group discussion in the study area physical land management practices activities were almost carry out by male members of the family and female were limited mostly to performing domestic activities. In other hand, this implies that female was engaged by the home services activity rather than endours to rural community. Therefore, In order to, differentiate male from female or vice-versa land management process. Male respondents were responded the level of introduced physical land management practice better than female-respondents in the study. By Adimassu (2005); Aklilu (2006) reported that soil and water conservation investments were limited rather in rented operated lands, this reason their productive land fertility low and it productive yield also decrease. And also In the study area land management practices activities were almost carry out by male members of the family and female were limited mostly to performing domestic activities. In line with result by (Benin,

2006) women are also sometimes inhibited from making determine about land management practices while their husbands are away. But not nagrue the researcher in most case the female were effectiveness of the soic economic development of a region. Table 4.1.2, percentage of distribution respondents based on their sex.

Number of sex respondents	Frequency	Percent
Male	96	84.2
female	18	15.8
Total	114	100.0

Source: (Survey data, 2020)

During data collection the interviewer said that female respondents have not enough strong inorder to prevent their farm land. Generall**y** sex respondents were the enrollment of introduces physical land management practices responded.

4.1.3. Marital status of respondents

The marital status of respondents one of soci economic demography characterstics were reveals that 53(46.5%) of the married respondents were believed that implement physical land management practices. 32(28.1%) of the separate respondents were the physical land management practices and also 29(25.4%) of the divorceed sample respondents were reveals the introduce physical land management practices in the study area. The researcher concludes that married were most the essential of physical land management practices. Even though the major problems practices were the indigenous one but not uniformily exercise the introduced physical land management practices in the study area. For futher information depicts in table 4.1.3 precntage of distrbution respondents based on martial status

Marital status of respondents	Frequency	Percent
married	53	46.5
divorced	29	25.4
separate	32	28.1
Total	114	100.0

Source; (survey data 2020)

4.1.4 Family size of respondents

According to this study, household size was a group of persons living together in the same housing unit. More over, group discussant in the study area there was low family planning and this is might be the factor for large family size. A study by (Yilma et al., 2010) stated that as a large family size results in increase of food demand, it ultimately ends up with food insecurity. Based on the study area depict that 62(54.4%) of surveyed respondents were from 4-6 family members actives envolvement of physical land management practiesc; 33(28.9%) of the respondents were from 7-8 family members belived that answer physical land mangment practices and 14(12.3%) of also 5(4.4%) of respondents were from 0-3, > 8 respectivly family members depict that preventing physical land management practices in study area. In table 4.1.4 percentage distribution of respondents basen on family size

Number of family size respondents	Frequency	Percent
0-3	14	12.3
4-6	62	54.4
7-8	33	28.9
>8	5	4.4
Total	114	100.0

Source; (survey data 2020)

4.1.5 Education level

The variable that is considered as independent variable is educational status of the respondents. It is expected to have significant positive influence on introduce physical land management practices its impact in raising the level of farmers' awareness. Also the education level increases the ability to obtain how to do something and use the information. So, educated farmers depict were more likely to decide to use physical land management practices. Whereas, non-educated farmers lack awareness and implemention their farm land. Therefore, education was emphasis to have a positive influence on farmer's implement physical land management practices. By (Ervin, 1982, cited by Getachew, 2005) and By (Tola,2015), state that education helps access to information and credit to purchase agricultural inputs that have better contribution for more effective agricultural land management practices. These idea agrue but differ from study area, target population, topography, model of data analyzed. This implies the researcher conclude that

the more educate farmers were done better implantation of physical land management practices. Let as shown in table, 4.1.5 Percentage distribution of respondents based on their educational level.

Education level of respondents	Frequency	Percent
0-4 grade	79	69.3
5-8 grade	25	21.9
9-10grade	9	7.9
11-12grade	1	.9
Total	114	100.0

(Source: surevy data, 2020)

As the table depict that 79(69.3%) of the respondents were reponed under 0-4 grade class where as 25(21.9%) of respondents were responded 5-8 grade class. This impies study conducted on sample respondents enaged none educate farmers and also pirmerly school complted. As conclude that education is the significat value of proper utilize on introduce physical land management practice. But the levels educated respondents were incrase the effect of influence also decrase on introduce physical land management practice decrase.

4.1.6 Size of farm lsand respondents

Size of farm land respondents	Frequency	Percent
0-0.5ha	3	2.6
2-2.5ha	15	13.2
3-3.5ha	42	36.8
>3.5ha	54	47.4
Total	114	100.0

Source: (suervy data, 2020)

As the above table 4.1.6 sub section indicated that, average size of farm land were majority of total respondents' 54(47.4%) of above 3.5ha; whereas, about 42 36.8%) of responedents were between 3-3.5 ha; 15 (13.8%) of the sample respondents between 2-2.5ha and 3(2.6%) of respondents were belived that the size of farm land less than 0.5ha. On the other hand, only few sample respondents 15(13.2%) and 3(2.6%) of responded as they revals size of farm land less than 2-2.5ha and 0-0.5ha respectively (see table 4.1.6). From this, concluded that smaller large size of farm land might be conserve introduce physical land management practices for plot land.

Where as smaller farm size also low practice intoroduce physysical land. While during the group discussant of respondents were arguing that with larger farm sizes were expected to practice execelncy prevent introduce land management practices. Whereas farmers had smaller farm sizes, they were less practing of their fram land. (Group disscants 1: Feburary 23, 2020)

4.2 Introduced physical land management practices

Now a days, the government try to facilities the rural household farmers using introduce advanced technology agricultural inputs their plots of land in order to sustainable development of land management practices. When introduce physical land practices were utilized in the land users it brings increase the physical land productivity. Such as the soil ersoin minimaize, soil fertility, depth, texture, color increase. And the land use sytem also developed. Though the introduce physical land management practices were not evenly implement in rural households level. This implementation measures were quntifyers to conserving soil and water. Simple adopted from top dwon approach sytem even though therotical aspect were not full endours for rural farmers be implement at zonal and local level. So, the researcher try to assess the draw back level of implement introduce physical land management practices were conducted on the study area.

4.2.1 Prevent the physical land management practices

The preventing physical land management practices mainly confined run off water, post erssion, stones class land, water logging, soil infiltration to through practices minimaize tillage system; contour plowing; Agedem mares; constrected terrace more steepness slope;cut off drain; and waterway and check dams.the practices were improved the physical land components of the soil depth, structural, teture and fertility. These developed the agricultural productivity of certain region. Accourding to the surevy data respondents were responed the following result, thus let as described in table 4.2.1 precntage of distribution respondents based on prevent

do you prevent the physical land management practices in your locality	Frequency	Percent
yes	105	92.1
no	9	7.9
Total	114	100.0

As the above table depict that, 105(92.1%) of the total sample size respondent belived that to responded prevent their farm land. whereas 9(7.9%) of sample respondent were responded not prevent their farm land. based on these conclude that 92.1% of households residence in the study area were acting direct or indirect engaged prevent of physical land management practices each kebeles.in fact, they knows the negative impacts for the absence of land prvevinting process in the respondents.

4.2.2 The Level of introduce physical land management practices in study area

These practices were attached to the independent variable for direct involves to physical land management practices. During the surevy data confined with in the study area revales that 91(79.8%) of sample respondents were informed the use of indigenous physical land management practices practices. whereas 23(20.2%) of sample respondents were also informed the use of introduce physical land management practices. thus the majority of respondents agrue that indigenous practing in the study. Because of there were easy, low cost, easy to understand, the raw material also acssbility. But the introduce practices were not easly under stand, very costy, not acssbilty to raw materials and had more scnitifict procedural. In table 4.2.2 precntage of distribution responedents based on level

Level of introduce plmp	Frequency	Percent
introduce	23	20.2
indigenous	91	79.8
Total	114	100.0

(Source: surevy data, 2012)

The group disscants of respondents were awareness to the level of introduces physical land management practices. This implies that, not the whole part of sample size respondent in each kebeles. More or less they were implement by woreda officer allow and seems like massive mobilize soil and water conservation program. (Group disscants: 2; February 26, 2020)The above response of the informant indicates that, most case of introduce practices were constracting as obligation matter rather willingness.

4.2.3 Type of introduce physical land management practices in the study area

The type of introduce physical land management practices in the study area	Frequency	Percent
terrace	13	11.4
cut off drain	4	3.5
water way	85	74.6
check dam	12	10.5
Total	114	100.0

(Source: surevy data, 2020)

Acorrnding to the above table 4.2.3 Sub section presented 85(74.6%) of sample respondents were responedintroduce physical land management practices which was (water way). Whereas 13 (11.4%), 12(10.5%) and 4(3.5%) of of the respondents were responed introduce physical land management practice which were (terrace, check dam and cut off drain) respectively. the most use their farm land. besides this the most frequntely practices for gentle slope land water way similarto fesses the indigenous practices were recommend in the study area.

Even at that, the development agents' informant informed waterways or channels were stabilized by planting grasses or need to be paving with wider stones to strength it. Besides that, they described the relative proportional distribution of water ways with number of farmers who construct it. (Key informants: Feburay 16, 2020)

4.3. Indigenous physical land management practices

This were the second independents variable that influence the physical land management practices in the conducted woreda Indigenous peoples' traditional model of education is a balanced and complementary model acceptable to the local community. The value of indigenous knowledge is not only limited to agriculture, environment and biodiversity. It has an immense value in education, medicine symptoms, and traces the disease to the context of the person's life, rather than a bacteria or virus.(S.G.J.N.Senanayake.2006).likewise, It also describe that the indigenous land practices was a typical knowledge that helps to guide and rules to task do its procedure for applying on farm land.

Indigenous land management practices were simple structures of a short-term nature that could be reshuffled each year to make use of the soil captured above the structure and avoid rodent production (Tsegaye and Bekele, 2010), They are built upon farmers' indigenous knowledge as

part of their farming practices that have evolved through the course of time without any outside institutional interventions (Tadele Kfile, 2014). In line with this result the researcher were examine the result of indigenous land management practices seen table 4.3. These depict the prcentage of distribution respondents based on indigenous practice. Baed on this 72 (63.2%) of respondents were revals that indigenous practices which was (fesse practices) in their farm land. where as 23 (20.2%) of, 19(16.7%) of respondents were responed indigenous practices which were (Agedm mares, Yedniber sar) respectively in their farm land of the study.

Indigenous physical land management practices	Frequency	Percent
Agdem mares	23	20.2
Yedinber sar	19	16.7
fesse	72	63.2
Total	114	100.0

During key informants interview respondents were responed the indigenous physical land managing practices taken place their livelihood of agricultural land. They told that these practices were developed from agrarian agriculture economy activity was flourishing our country. Though, the indigenous practices have also different from land characters. The most encourage practices of in the study area fesse, Agedem mares and yedinber sar. Basically topography has its implication to do something.even the area was mostly gentle slope land made indigenous one. (Key informants interview no.1: January 2020)

The above narrative indicated that, the respondents strong argue the indigenous physical land management practices were enough desire and experience to manage and they linked with a long year ago until alive. But the introduce knowledge physical land management practices done through by enforcement.

4.4. Perception of farmers on introduced physical land management practices

There is general understanding that the better farmers perceive problems of physical land management practices, the better they can involves to achieve introduce sustainable physical land management practices. Although, have significant relationship is observed between farmers' perception of introduce physical land management practices problem on their own farmland and

their practices of introduce physical land. And also they are aware of the land degradation problem on their land, yet they might not feel the real impact of the problem.

Under this section aimed at an assessing of farmers' perception of introduce physical land management practice were theoretically known to be determinants for adaption and sustained use over time. Here under this the study area were identify the respondents by yes or no confirmed response of farmers' perception introduce physical land management practice. As indicate that many resrrachers agrue that preception were to identifying the problems of a certain cuase and consqunce. Most of precption of result juage by descriptive, explanatory by words but not describing by quantify measureable. By (Yeshambl.Mulat, 2013) result state that farming experience of the farmers also played an important role in the farmers' perception of soil erosion problems. A wider time of experience as gained through living as a farmer in the locality helped farmers to perceive the processes and effects of soil erosion happening at the localities than short lived experience of farmers. Regarding to the attitude of farmers‟ towards the acceptance and implementation of physical land management technologies and strategies need to be adopted and implemented on their farmlands (Bizuayehu .Alemu, 2014). The researcher tried to understand their perceptions during group discussions conducted with farmers of the study area. Furthermore, the researcher wanted to know development agents understanding on farmers' attitude towards agricultural land management practices.

The implementation of terracing management technology is not equal interst. It makes wastage in fragmenting own plot of lands and also loss their time to construct. Based of the sample respondents were also associated that no need of level terrace constract in gentle slope of plot of land and minimaize the productive parcel of land. Agrue that the perception of farmers on introduces physical land manage practices farm land information is not equal understand. By Nuwagaba *et al.,* (2001) also farmers' decision to utilize soil management practices is often governed by their individual assessment of benefits and resource implications of using particular practices.Farmers refer to the expected aaded value in respect to their objective functions; practicability of what is being proposed and it's fit within the ongoing farmers' practices (Leeuwise, 2004). , the researcher was confined to the above idea but difer with research design, study population, sample size, way of data presented and other para meter the study area. In table 4.4 precntage ditrbution of respondents based on interst/awareness/.

The interst of introduce land MP	Frequency	Percent
yes	28	24.6
no	86	75.4
Total	114	100.0

From the above table shown 86 (75.4%) of respondents were responded awareness for introduce physical land mangment practices in their farm land.where as 28(24.6%) of respondents were not interested to the introduce physical land management practices in the study area. As conculude that majority of the sample respondents' belived that an awarnees for introduce physical land management practices.

In the group discussants were had an anwarness of the introduce physical land management practices. In addation to during constraction of terrace practices they said that loss their land size. Most case the introduce practices were work by masse moblaize method, some farmers the night time destroyed constracted terrace they consider decerase the land size. (Mebeshi respondent: January 28; 2012)

Also farmers were pointed out three reasons why they were not motivated to construct artificial water ways. First, labor intensive nature of it, second, space taking nature, third, do not made according to their decision and interest. (Arbaytu respondent: January 22; 2012)

4.5. The diterminat factors of introduce physical land management practices

In this study, data analysis were applied on such major factors as topography, distance from farm land, farm size, development agent experts were assumed as problems of physical land management practices. Therefore an attempt was made to find out the relationship between these factors and introduce physical land management practices. The physical land management a practice was taken as dependent variables, whereas the listed factors mentioned was the independent variables.

Binary logistic regression model is applied to analyze the relationship between independent and dependent variables. The dependent variables predict the presence or absence of characteristics or outcomes based on the value of a set of predictors or independent variables. Before proceeding to the analysis, model fitness was considered for land management practices. As the significance value greater than 0.05, in case of physical land management practices.

Table 4.5: Biniary logistic Regression Estimation Result

Variable	Parameter of cofficent	p-value	Odds ratio
Farm land size	.842	.009***	2.321
Topography	-1.802	.021**	.165
Distance from farm land	2.950	.000***	19.114
Development agent experts support	-.639	.014**	.528
Constant	.799	.576	2.223

*Notes: ***significant at 1% level; **significant at 5% level*
Source: Results from the Binary logistic regression output

4.5.1 Farm land size: As table 4.5 result show that farm land size has a positive estimated coefficient and also statistically significant at the 0.05 % confidence level. This indicates the farmland size significantly affected the probability of introduce physical land management practice with p-value and odds ratio of 0.009 and 2.321, respectively this odds ratio indicated that the propoblity of large farm size households 2.321 higher than small farm land size to practices introduce physical land management. Some studies reported that farmers with larger farm size have more cash to hire labor to undertake land investments that has direct impact on land management practices (Pender *et al*., 2004; Bekele and Holden, 1998). Therefore, farm size is hypothesized to influence adopting of introduced land management practices positively.

4.5.2. Toporaphy: As table 4.5 result show that topography has a negatively estimated coefficient and also statistically significant at the 0.05 % confidence level. This indicates the topography significantly affected the probability of introduce physical land management practice with p-value and odds ratio of 0.021 and 0.165 , respectively this odds ratio indicated that the propoblity of topography on steep slope farm land of respondents were 0.165 higher than gentle slope farm land to implement introduce physical land management.this indicated that farmers had steep slope farm land wanted practices introduce physical land management but practical they were not implement in their farm land.

During key interview respondents were responded that all most all the woreda rural kebeles are covers by gentle slope. This helps for evry economic activity take place except some of woreda kebeles had up and down slope or steep slope. Even if they were a theortical practices of introduce physical land mangment.But not known technical implementation of introduce physical land mangement practices in the study area. (Key interview, no 12: January 2020).

4.5.3 Distance of farm land: As table 4.5 result show that distance had a positive estimated coefficient and also statistically significant at the 0.05 % confidence level. This indicated the distance of farm land significantly affected the probability of introduce physical land management practice with p-value and odds ratio of 0.000 and 19.114 respectively this odds ratio indicated that the propoblity of distance near farm land of respondents were 19.114 higher than far farm land to practices introduce physical land management. Previous research found a positive effect of this variable on adoption of land management practices and conservation structures (Bekele and Holden,1998; Fitsum, 2003; Wegayehu, 2003; Pender et al., 2004).

4.5.4 Development agent experts support: As table 4.5 result show that the support of development agent experts negatively estimated coefficient and also statistically significant at the 0.05 % confidence level. This indicated the support of development agnts significantly affected the probability of introduce physical land management practices with p-value and odds ratio of 0.014 and 0.528 respectively this odds ratio indicated that the propoblity of continous support of developmental agents of household respondents were 0.528 higher than not continous support house holds to practices introduce physical land management. Even if developmental agents support conitnously but the implementation level was less. This might be most farmers had therotcial knowledge about introduce physical land management practices in their farm land. But they had not technical knowledge to implement introduce physical land managmenet. But previous research found a positive effect of this variable on support of development agents on introduces physical land management practices. The frequency of contact between a farmer and development agent is hypothesized to be the potential force to accelerate effective dissemination of adequate agricultural information that in turn enhances farmers' decision to adopt agricultural practices (Kidane, 2001; Degnet, 1999). And by (Addisu, 2011) In line with this result, The practices of good physical land management and the implementation of level of land use policy have to be supported by qualified and well skilled development agents support experts. Agricultural development agent is critical to introduce physical land management practices better and land management technologies particularly to smallholder farmers in the country like Ethiopia where traditional agricultural practice is extensively practice.

CHAPTER FIVE

5. CONCLUSION AND RECOMMENDATION

5.1. Summmery and Conclusion

Nowadays, practicing the level of introduce physical land management technology has become a considerable idea due to its result suring land management productivity and its value added to sustainable the natural resource on ecosystem. Therefore, this study attempted an assessment of the integrated physical land management that is currently practiced. So the research condacted on an assessment of the integration level of indigenous and introduce physical land management practices Jabetehnan woreda.it was intended to achieve the following specific objectives: to identify implementation level of introduced physical land management practices: To assess perception of farmers on introduced physical land management practice and explore the determinant factor affecting of introduced physical land management practices.

To this effect, the study was using by mixed methods research approach where the qualitative approach was explain from the result of quantative approach. The informants for the qualitative methods (such as Key informant interview and FGDs) were selected purposively. Furthermore, as part of the quantitative approach, the total number sample size 114 respondents were employing cluster proportional sampling techniques from each kebeles.Accordingly, Questionnaires, key informant interviews and focus group discussions (FGD) were employed as the major surevy data collection. Also the study were the limitation of introduce physical land management practice in the selection woreda. To justify existing problem between technical gap the woreda community people. In order to implement the level of introduce physical land management practices in the local community. Therefore, presents a summary of the study's major findings and conclusions.

The general objective of this research is to identify the level of introduce physical land management practices the case of Jabitehnan woreda, Amahara regional state. The findings of the research seem to show that the woreda is experiencing the introduce level on physical land management practices. Binary regression model results shown the fact that educational status of farmers, farm size, distance from farm land, development agents and topography have negative

significant impact introduce physical land management practices. Other remaining factors such as farmers' perception on introduce physical land management practices the age, sex, marital status, family size have less significant influence. Therefore as concluded that in making interventions in introduce physical land management practices, there should be active participation to development agents expert with, primarily the farmers, facilities continuous training center for farmers, motoring and evaluation the rural farmers household are exercise Amahara regional state of land use directive, 2010 execrise each plot of land ownership. This helps to developed level of introduce physical land managing system. However, in designing sustainable introduce physical land management land practices programs, local specific factors need to be given attention. Thus, a comprehensive study national level on determinants of farmers' physical land management practices can have a significant role in getting better understanding on the issue. Such national level studies can also serve as a guide to local level studies on introduces physical land management practices. Hence, concerned actors should give attention to the importance of conducting research specific to determinants of introduce physical land management practices at national level.

5.2. Recommendation

Based on the findings of the study the following recommendations are forwarded:.

- The implementation level of introduce physical land management practices need to be adapted and actual implement in land users people within its standard measuraments.
- Farmers' implement on indigenous physical land management practices should appreciated and recognized and hinder for introduce physical technology facilities.
- To achieve physical land management practices, increasing the level of introduced practices continuously manaer.
- The authrioze /geverment institution /should have incetive and recognaized the development agnts.
- Changing negative thoughts and enhancing farmers' motivation on preserving task of introduce physical land management measures practices and avoid enforcement implement of introduce practice.
- Making continuous training for implementer agents and implemention process especially introduce practicing.
- Should developed the construction mechanism of introduce physical land management practices to end users.
- To facility and built training center for agricultural introduce inputs and to maximize the land productivity by adaptive mitigeation system.
- The excise the down top approach rather than top down approach in order to the accuracy of implemention level of performance physical land practices.
- Avoid the turn over experts of agricultural development officer and development agents and other supportive staff members.
- Work with stockholder groups in order to incrsaeing farmers technical gap measures of their farm land practice.
- Should interve Steep slope land structural will constraction methods involves in practical measurement will apply.
- Avoiding for negative twards with gender quality in order to conserve introduce physical land management practices and parcipate policy and program for environment safe.

- Montoring and inspection of farmers will be support real program and time duration and the deterioration about their local resource should be taken as an opportunity to design better implement methods.
- Facilities like farmers training center, extension agent, supply agriclutureal inputs , getting full information about technical , applying way of introduce technology and low cost , minimize tillage, contour plowing, minimize before harvesting season, and Agedm mars are also important for effective integrated physical land management practices and also it needs the collaboration of regional and government bodies.
- To minimaize the gap between development agents and end land passion. .
- To facilities Capacity building before farmers ploughing their parcel of land in order to scaling up to an effective introduce physical land management practices and to the productivity of land from season to season.
- Finally, the researcher recommends all the conducting result to study further examine the depth and implement measurement of introduce of physical land management practices.

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Appendix

Appendix A. Questionnaire for Respondents

DEBRE MARKOS UNIVERSITY

College of Social Sciences/ Graduate Studies

Department of Geography and environmental studies

Objective: Dear respondents the main purpose of this questionnaire assessing the level of introduce physical land management practices to farm land for user. For the success of this study, you are kindly requested to put your response through transparency and honesty. Your information is required only for the research work so that the confidentiality of the information will be kept and also may take about 15 Minutes of your time to complete, but your answer will play a crucial role to the study I am conducting on researcher paper.

Thank you in advance!!

Direction

For close-ended questions please put a "mark" in the list corresponding to the option that contains your answer, and for open-ended questions please write the answers

1. Question no. _____
2. Date of interview_____
3. Checked by _____ sign._____

I.

I. **Socio-demographic characteristics of the respondents**

Please give your responses accordingly:-

1. Name of kebele-……..
2. Age of respondent? 1. < 25 2. 26-35 3. 36-45 4.46-55 5.>55
3. Sex of respondent 1. Male 2. Female
4. Number of family size 1. 1 -3 2. 4-6 3. 7-8 4. Above 8
5. Educational level of households

1. (0-4) grade
2. (5-8) grade
3. (9-10) grade
4. (11-12) grade
5. (12) grade above
6. Marital status 1. Separate
   2. Married
   3. Divorced
   4. Widowed
7. What type of your farm land topography character?
   1. Gentle 2. Up and down
8. How many distance from farm land to your home 1, < 2km 2, others

II. **Questions related to indigenous and introduce physical land management practices**

1. Which type of mostly use physical land management practices in your farm land?
   1. Indigenous 2. Introduce

2. If your answer is "1" for question No 1 what kind of indigenous physical land management practices do you use? Please list dwon

No	Indigenous of physical land management practices in your farm land
1	
2	
3	

3. Which types of indigenous physical land management practices do you have apply in your farmland? Please write in terms of rank.

No	Indigenous physical land management practices	Rank
1	Agidem mares	
2	Feses	
3	Yednber sar	

5. Do you use introduce physical land management practices in your farm land?

1. Yes 2. No

6. If your answer is "Yes" for question No 5 what kind of introduce physical land management practices do you apply? Please write your answer.

No	introduce physical land management practices
1	
2	
3	
4	

7. If your answer is "No" for question no 6; please explain it the reason …….

8. Which types of introduce physical land management practices do you have apply in your farm land? Please write in terms of their rank.

No	introduce physical land management practices	Rank
1	Terrace	
2	Cut off drain	
3	Water way	
4	Check dam	

9. Do you know the implementation level of introduce physical land management practice measures in your kebele? 1. Yes 2. No

10. If your answer is No for question 9 please explain it the major reason for implementation level of introduce physical land management practice measurements? …….

11. What knid of introduce physical land management practices in 2012 increse in woreda? Please explain it……

III. Farmers perception on introduce physical land management practices.

1. Do you have an interest to apply introduce physical land management practices in your farmland?

1. Yes 2. No

2. Which types of introduce physical land management practices regularly recommended in your farmlands? Please write in terms of their activities degree using this symbol "√"

No	Implemtion level of introduce physical land management practices	Very high	high	Medium	Poor	Very poor
1	Terrace					
2	Cut off drain					
3	Water way					
4	Check dam					

3. Do you understand that introduce physical land management practices are effectively implementation in your farm land? (please write your answer using this symbol"√"

No	Effectiveness for implement based on understand	Use "√"
1	Very Effective	
2	More effective	
3	effective	
4	Not effective	
5	I do not know	

V. Questions Do you distance from home to farm land affected the level of introduce physical land management practices

1. Do you get any information about introduce level of physical land management practices from agriculture development expert?

A. Yes B. No

2. If your answer for Q1 is "yes" how many come to the experts in your farm land?

1. Once per a year
2 once per a month
3. Twice per a month
4. Once per a week
5. Twice per a week

3. If your answer for Q2 is "No" what do you think the reason it?

1. There is no any agriculture development experts assigned in our kebele
2. Agriculture development experts are not interest to do so

3. I am not familiar to work of development agriculture experts
4. Their advice is not considered my economic background
5. I do not need any advice

4. Do you get any training for physical land management practices? 1. Yes 2. No

5. If you answer for 4 "yes" how do you get ? ----------

6. What are the major factors that affecting assessing introduced level of physical land management practices?

No	Major factors affecting to implement introduce plmp	Rank
1		
2		
3		

7. Do you have any suggestion or opinion about the introduce level of physical land management practices in your farmland? Please explain it.

THANK YOU FOR YOUR COOPRATION!

Appendix B. key informants interview guiding questions for an Respondents

Dear respondents the main purpose of this key informants interview an assessing the level of introduce physical land management practices to farm land for user. For the success of this study, you are kindly requested to put your response through transparency and honesty. Your information is required only for the research work so that the confidentiality of the information will be kept and also may take about 15 Minutes of your time to complete, but your answer will play a crucial role to the study I am conducting on researcher paper.

Thank you in advance!

Key informants ……..

Date of discussion ……

Respondent code……..

Sex of respondent …….

Age of respondent……..

Name of kebele…….

1When were the introduce physical land management practice in the woreda?

2. What was your education status?

3. How many distance from farm land to your home

4. Which type of practice is dominantly practice in this woreda?

5. What are the best practices currently in this kebele?

6. What are the farmers' perceptions on introduce land management practice in this kebele?

7. What are your farm land slope characters?

8. How many development agents come to in your farm land?

9. What are the major determinat factors affecting asseesing the level of introduce physical land management practices in your farmland?

10. What is your opinion about the major implementation level of introduce physical land management practices in your farmland?

THANK YOU FOR YOUR COOPRATION!!

Appndix C. Focus Group Discussion guiding questions with (IPLMP*)*

Dear respondents the main purpose of this focus group discussion assessing the level of introduce physical land management practices to farm land for user. For the success of this study, you are kindly requested to put your response through transparency and honesty. Your information is required only for the research work so that the confidentiality of the information will be kept and also may take about 15 Minutes of your time to complete, but your answer will play a crucial role to the study I am conducting on researcher paper

Focus group discussion check lists:

Name of Kebele……..

Respondent code……..

Sex of respondent ……

Age of respondent …….

Family size……..

Education level……

Date……

1. When physical land management practice will start?
2. . Which types of indigenous physical land management practices are applied in your farmland?
3. Which one of introduce physical land management practices are effectively applied in your farmland?
4. Do you get information about introduce physical land management practices in your farmland?
5. How many the development agent come to in your farm land?
6. What are the most familiar activity of introduce physical land management practices in your farm land?
7. What are the farmers' perception the level of introduce physical land management practices?
8. What are the major factors that affecting assessing level of introduces physical land management practices in your farmland?

Appendix D. List of research participants for Key Informant, Focus Group Discussions, and Structured Interviews

Respondents for key-informant interview

No.	Research participants	The whereabouts of participants
1	Key Informant #1	The Jabitehnan Woreda Office leader(Agricultural development bureau)
2	Key Informant #2	Three selected Informants from 1 Jabitehnan woreda officer and 2 kebeles development agents.

List of Focus Group Discussion Participants

Focus Group Discussion One

Discussants' respondents name	Sex	Age	Place of residence	Position
Adamu Yzengaw	Male	63	Rural	Survey farmer
Wosise Ayechew	Male	48	rural	Survey farmer
Tisegaw Melse	Male	43	Rural	Survey farmer
Birhan Getahun	Male	46	Rural	Survey farmer
Msiganaw Adamu	Male	38	Rural	Farmer
Smegni Alegya	male	45	Rural	Survey farmer

Focus Group Discussion Two

Discussants Respondents name	**sex**	**Age**	**Place of residence**	**Position**
Lijalem Fetahun	Male	50	Rural	Survey farmer
Tefaye Yesmaw	Male	49	Rural	farmer
Amanu Alehgni	Male	36	Rural	Survey farmer
Swalem Nigate	Female	42	Rural	Survey farmer
Abiwot Gebeyehu	Male	39	Rural	Survey farmer
Zewode Lnigerw	Male	53	Rural	Survey farmer

Appendix .E. During focus group discussion

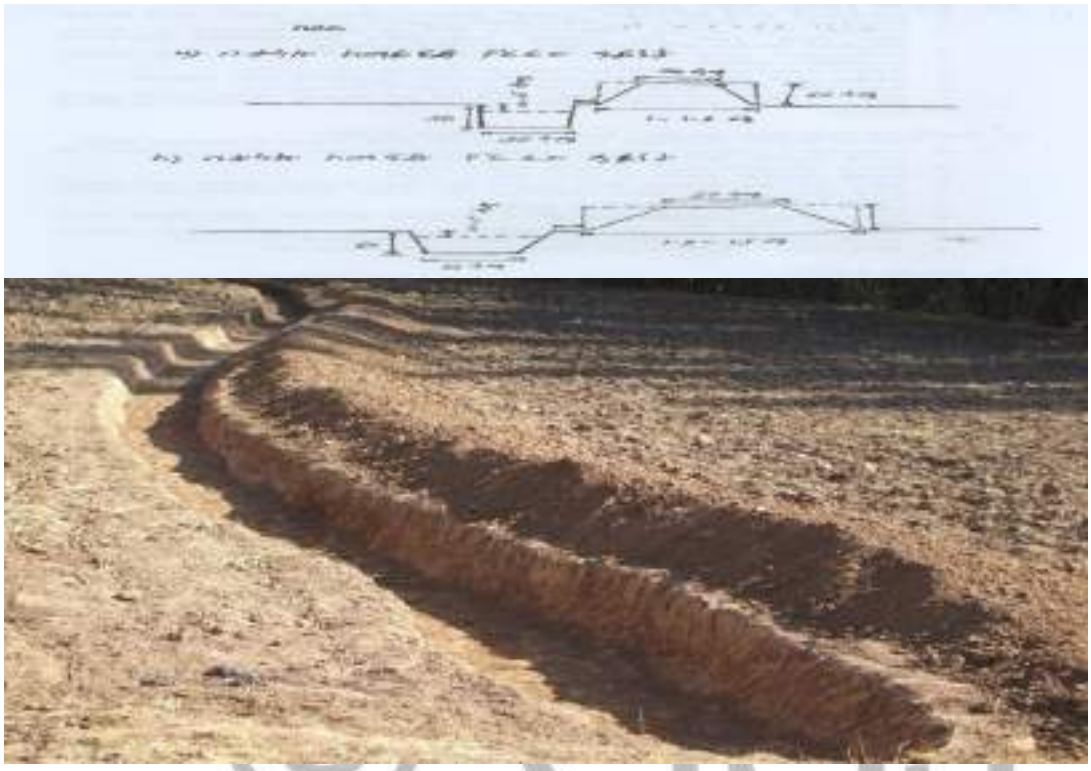
Appendix. F. Photography during interview data collection

Appendix J. Field photographs agricultural development agents

Appendix H. photos capture for dinber sar

Appendix I. Survey data for terrace in farm land area

Appendix J. based on standard measurement



Appendix K. Cut off drain

Appendix .L. water way

Appendix .M. Check dam

Appendix .N. Terrace

Appendix Table 1: Biniary logistic Regression Estimation Result

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	FLS	.842	.322	6.816	1	.009	2.321
	TOPS	-1.802	.778	5.365	1	.021	.165
	DSFL	2.950	.714	17.088	1	.000	19.114
	HMTDACYFL	-.639	.260	6.044	1	.014	.528
	Constant	.799	1.427	.314	1	.576	2.223

a. Variable(s) entered on step 1: FLS, TOPS, DSFL, HMTDACYFL.

Appendix.O. Survey questionnaires are translate to Amaharic

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Declaration of Originality

I, Negash Kassahun , hereby declare that the thesis entitled “An Assessing the level of introduce physical land managmenet practices : The Case of Jabitehnan woreda,Amahara Region,North West Ethiopia.” is my original work and has never been presented or published in any other institution. I also declare that any information used in this thesis has been dully acknowledged.

Negash Kassahun

Signature _____

Date _____