Journal of Natural Sciences Research www.iiste.org
ISSN 2224-3186 (Paper) ISSN 2225-0921 (Online) DOI: 10.7176/JNSR
Vol.9, No.17, 2019

# Farmer's Perceptions on the Farmland Management Practices, Perceived Challenges and Prospects: The Case of Mareka District, Dawuro Zone, Southern Ethiopia

Getahun Bore[1] ShitayeBekele[2]
1.Department of Plant Science, Dawuro-Tarcha campus, Wolaita Sodo University, Tarcha Ethiopia
2. Dawuro Zone, Environmental Protection and Forest office, Tarcha Ethiopia

**Abstract**
The present study was undertaken in Mareka District, Dawuro Zone, Southern Ethiopia to assess major types, perceived challenges and prospects of farmland management problems in the study area. Mixed research design was used, and both primary and secondary data were collected. Descriptive statistics such as frequency, mean, and percentage were used to describe the background information, types and prospects of major farmland management problems of sample households in the study area. The result of this study revealed that educational status, types of crops cultivated, population pressure, deforestation, culture, over grazing, lack of awareness, topography and poverty are among the challenges that affect farmland management practices in the study area. According to the perception of sample households, there are prospects like favorable government policies and strategies, availability of extension services and scaling up of best practices and establishment of farmer training centers. Thus, to secure sustainable farmland management practices proper monitoring and evaluation, conservation oriented crop combination land management, afforestation, agro-forestry, adequate training in farmer training centers, access to information and proper planning of the population growth are highly recommended for the study area.
**Keywords**: Challenges, Prospects, Farmland Management Practices, Mareka District.
**DOI**: 10.7176/JNSR/9-17-05
**Publication date**:September 30th 2019

## 1. INTRODUCTION

Farmland management determines the sustainability of natural resource management and agricultural practices and productivity of a country, fertility of the soil and quality of environment mainly where agriculture is the leading economic activity in Africa in general and Ethiopia in particular (Emmanuel, 2014)]. Ethiopia is among those countries in Sub-Saharan Africa that are reported to suffer from challenges of farmland management as agriculture is the main income source in the country. The country, with a population that doubled from about 39.8 million in 1984 to over 94 million in 2014, is now the second most populous country in Africa with an annual growth rate of 2.6 percent (World Bank, 20142).

The Soil Conservation Research Project has estimated annual soil loss of about 1.5 billion tons of soil from Ethiopia (Hurni et al., 201; Genene, 2014). However, food gap increased and agricultural land has become a growing problem due to population pressure, soil erosions, depletion of soil organic matter and soil erosion, personal factors (education, farming experiences), overgrazing, over cultivation, and deforestation are the major challenges of farmland management problems ($FLMP_s$) in Ethiopia (Teklu and Gezahegn, 2003; Pender et al., 2006). According to Teshome (2010), the performance of Ethiopian agriculture has been poor over the last three decades. One of the root causes of such problem is poor and unsustainable land management practices. The direct costs of loss of soil and essential nutrients due to unsustainable land management is estimated to be about three percent of agricultural GDP or $106 million and the loss of agricultural value between 2000-2010 could be $7 billion, even without taking in to account the indirect impacts of land degradation in Ethiopia (Berry, 2003). Therefore, unless the present land management practices are reversed (Kumela, 2007), large areas of the nation's farmland will be deteriorated that in future threatens the present low level of production.

Thus, in many areas of Ethiopia maintaining and improving soil fertility and undertaking soil and water conservation is needed and it is vital to the achievement of food security, poverty reduction and environmental sustainability in the country (Mulugeta, 2007). Regarding soil conservation activities in Ethiopia, Tigray Region is relatively at good status at present time. This is by constructing different soil and water conservation structures to ensure and improve soil fertility, environment and increased agricultural production (MoA, 2010).

In the study area farmers are suffering from farmland degradation and low agricultural productivity due to poor farmland management practices, soil erosion, and low rates of adoption of best practices. In some cases, dis-adoption or reduced use of technologies has been reported (MWARDO, 2013). Though the District practiced different methods of soil and water conservation practices, it is still characterized by poor farmland management practices. There is also gap of information's on farmland management practices, challenges and prospects that include the very characteristics and agro-ecological aspects of the study area. Therefore, this study was proposed to assess the major farmland management practices, perceived challenges and prospects in the case of Mareka

District, Dawuro Zone, and Southern Ethiopia.

## 2. RESEARCH METHODOLOGY

### 2.1. Description of the Study Area

#### 2.1.1. Location, Climate, Agro-ecology, Soils and Land Use/Cover

Mareka District, Dawuro Zone, Southern Ethiopia, is geographically located between $6^0$09'' and $7^0$21''N Latitude and $37^0$01''E and $37^0$26''E Longitude (**Fig.1**). The elevation of the District ranges between 1360-2541 masl. The divisions of relief features include plateau, plain and valley. The District is divided in to three agro- climatic zones such as dega (*gezee*), woyna-dega (*dashuwa*) and kola (*gadha*) in local term (MWARDO, 2013). An estimated mean annual rain fall is 1401-1800mm and the annual mean temperature is 15-25ºc. Lengths of the growing period of the major annual rainy season were 211-270 days. The dominant soils in the area were Dystric Nitosols derived from Metamorphic Precambrian basement rock type (FAO, 1983). The total area of the District is about 46220 ha. The major land uses /cover were permanent crop cover (12.15%), annual crop cover (40.46%), settlement area (11.73%), pastoral land (0.79%), forest and bush land (20.27%), and others (14.6%) (MWARDO, 2013).

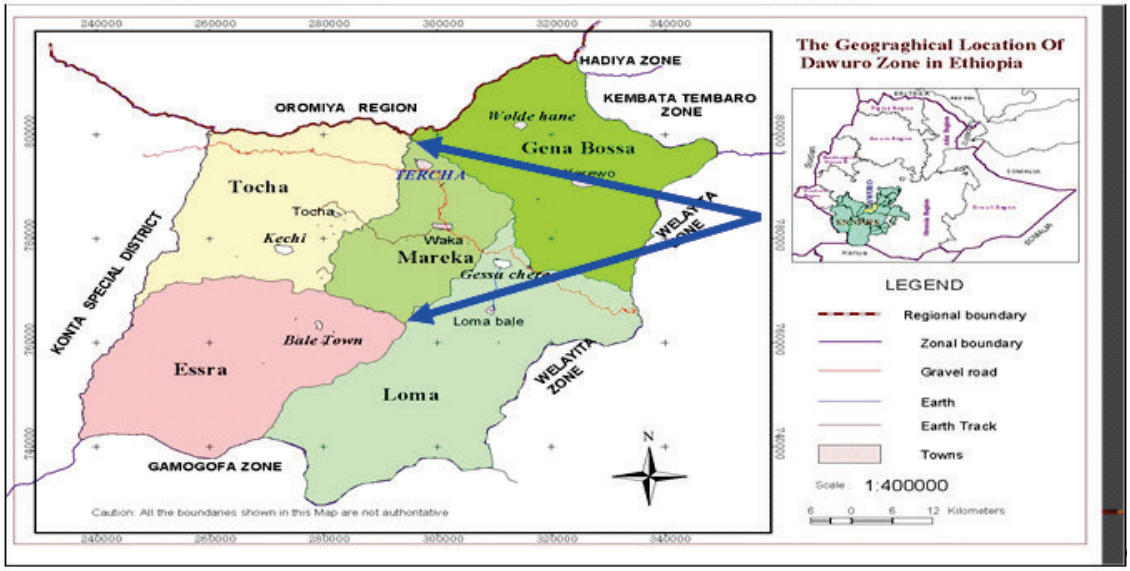


**Fig.1**. Location map the study area

#### 2.1.2. Socio- economic Characteristics

The population of Mareka District is estimated at 147,950 of which 73,235(49.5%) were males and 74,715 (50.5%) were females CSA (2010). The farming systems of the area are predominantly subsistence farming based on mixed crop-livestock production. The dominant crops grown in the study area include legume crops (faba bean, lentil and field peas), cereal crops (wheat, rye, barley, maize), perennial crops such as Enset (*Ensete ventricosum* L.*),* coffee, different agro-forestry tree species and eucalyptus plantations and root crops (potatoes and taro) and others. Large livestock number with low quality, limited health facilities, drugs and vaccines for animals are the characteristics of livestock production in the area. The livestock's reared in the area are cattle, goat, sheep and donkey (MWARDO, 2013).

### 2.2. Research Design, Sampling Techniques and Sample Size

In order to achieve the intended objectives mixed research design; specifically the concurrent triangulation design was used. It enables not only to gather quantitative and qualitative data, but also to collect within short period of time. The most important instruments employed to generate relevant information were questionnaires, key informants, interview, field observation and focused group discussions (FGDs) as well as formal and informal discussions with farmers.

Out of 37 kebeles in the District, three kebeles from varying topographic features and agro-climatic zones (Dega, Woyna Dega and Kola) were purposively selected (**Table 1**). In order to select sample households, random sampling was used by using simple algebraic computation (cri-cross multiplication). Hence, to determine and calculate the sample size at 93% confidences level and e = ±7% of precision level are used as criteria. The simple formula was used to determine sample size as indicated by Yamane (1967).

$$n = \frac{N}{1+N(e)2} = \frac{922}{1+922(0.07)2} = \frac{922}{5.5178} = 167$$

**Where**; n= sample size; N= the total house hold head; e= level of precision (0.07)

**Table 2**. Distribution of sample size in the study area

| Kebele | House hold size | | | Sample size | |
|---|---|---|---|---|---|
| | Male | Female | Total | Sample size | Sample size (%) |
| Gozo-Bamushi | 273 | 33 | 306 | 56 | 33 |
| Mada-Gobo | 293 | 70 | 363 | 65 | 39 |
| Tarcha-zuria | 211 | 42 | 253 | 46 | 28 |
| Total | **777** | 145 | 922 | 167 | 100 |

*Source: Computation based on data from CSA (2010).*

### 2.3. Data Analysis

The row data collected through questioners, FGDs and key informants were processed (coded, edited, ordered and organized) to generate relevant information. The collected data were analyzed using descriptive statistical technique like (frequency, mean, and percentage) by using the statistical Package for Social Sciences (SPSS) and Microsoft Excel software.

## 3. RESULTS AND DISSCUSIONS

### 3.1. Demographic and Socio-Economic Background of the Respondents

As it can be observed from **Table 2**, about 84.4% and 15.6% of the sample households were male and female respectively. The maximum and minimum ages of all SKA were 68 and 16 respectively. While, generally in the study area many of the sample respondents were found at productive age category.

In the study area, about 60.5% of the respondents were not able to read and write, while 13.8% and 7.2% of the respondents were grade 1-4 and 5-8, respectively (**Table 3**). The status of education is at the lowest level thus, it may require further intervention to prepare special arrangement to bring about significant effect on the status $FLMP_S$ in the area.

**Table 3.** Frequency and percentage distribution of respondents by age and sex

| | Frequency | | Percentage | | Total | |
|---|---|---|---|---|---|---|
| **Age categories** | **Male** | **Female** | **Male** | **Female** | **Total** | **%** |
| 15-30 | - | 1 | - | 0.6 | 1 | 0.6 |
| 31-45 | 77 | 19 | 46.1 | 11.4 | 96 | 57.5 |
| 46-64 | 61 | 6 | 36.5 | 3.6 | 67 | 40.1 |
| > 64 | 3 | - | 1.8 | - | 3 | 1.8 |
| **Total** | 141 | 26 | 84.4 | 15.6 | 167 | 100 |

The finding shows the majority (90.4%) of respondents were married that may have a good contribution regarding $FLMP_S$ as the more stable the family there may be higher probability for stable practices and stable livelihood activities (**Table 3**).

The household sizes of the majority of respondents (70.1%) were among 4-6 followed by 7-10 size (22%). The minimum size was 3 while the maximum was 10, with the mean 5.1 and the coefficient of variation (CV) 10.7% indicating only slight variation in family size. In general, over 90% of the respondents have large population (4-10) that implies high family size in sample kebeles (**Table 3**).

**Table 4.** Distribution of educational and marital status, and Household size of the sample respondents

| Parameters | Frequency | Percentage | Mean | St. Dev | CV |
|---|---|---|---|---|---|
| **Educational status** | | | | | |
| Can't read | 101 | 60.5 | - | - | - |
| Adult literacy | 31 | 18.5 | | | |
| 1-4 | 23 | 13.8 | | | |
| 5-8 | 12 | 7.2 | | | |
| **Marital status** | | | | | |
| Married | 151 | 90.4 | - | - | - |
| Unmarried | 1 | 0.6 | | | |
| Divorced | 5 | 3 | | | |
| Separated | 10 | 6 | | | |
| **Household size** | | | | | |
| <3 | 13 | 7.8 | 5.1 | 0.545 | 10.7 |
| 4-6 | 115 | 70.2 | | | |
| 7-10 | 36 | 22 | | | |
| Total | 164 | 98.2 | | | |

The findings of this has revealed that many (65%) of the respondents in the study area did not demanded for more children. The major reasons for this include population pressure, lack of farmland and economic, while the

need for labor, culture and religion related factors favored for more children (**Table 4**).

According to FGDs, the need for more children were appreciable in their culture and religion, but population pressure, lack of farmland and economic factor were discourage the demand for more children in recent year. The sample respondents who refused to have more children have started using family planning methods such as pills and loops. According to one of the key informants FLMPs has not been known in the study area until recently. Due to different biophysical and social factors most people recently started practicing FLMPs.

**Table 5.** Demand for more children and reasons for need of more children by respondents

| Demand option | Gozo-bamush | | Mada-kuiel | | Tarcha-zuria | | | |
|---|---|---|---|---|---|---|---|---|
| | Frequency | % | Frequency | % | Frequency | % | Total | % |
| Yes | - | - | 30 | 18 | 27 | 16.2 | 57 | 34.1 |
| NO | 56 | 33.5 | 35 | 21 | 19 | 11.4 | 110 | 65.9 |
| Total | 56 | 33.5 | 65 | 39 | 46 | 28 | 167 | 100 |
| **Yes(reasons for need of more children) (NO= 57)** | | | | | | | | |
| Need for labor | - | - | 30 | 18 | 27 | 16.2 | 57 | 100 |
| Cultural factor | - | - | 30 | 18 | 27 | 16.2 | 57 | 100 |
| Religious influence | - | - | 27 | 16.2 | 25 | 15 | 52 | 91 |
| **No(reasons for no need of more children) (NO=110)** | | | | | | | | |
| Population pressure | 56 | 33.5 | 35 | 21 | 19 | 11.4 | 110 | 100 |
| Lack of farmland | 50 | 30 | 41 | 24.6 | 9 | 5.4 | 100 | 91 |
| Economic factor | 34 | 20.4 | 25 | 15 | 35 | 21 | 94 | 88 |

As **Table 5** indicates that almost all (99.4%) of the respondents identified low productivity of soils in their farmlands by checking consecutive products. This may require proper intervention for improvements of soil productivity through different mechanisms.

**Table 6.** Distribution of soil productivity, size and distance of farm plot from the residency of the farmland by respondents

| | Frequency | Percentage | Mean | St. Dev. | CV |
|---|---|---|---|---|---|
| **Size of Farmland (ha)** | | | | | |
| <0.5 | 123 | 73.6 | 0.45 | 0.569 | 1.26 |
| 0.5-1 | 37 | 22.2 | | | |
| 1.1-1.5 | 7 | 4.2 | | | |
| **Soil Productivity** | | | | | |
| Medium | 1 | 0.6 | | | |
| Low | 166 | 99.4 | | | |
| **Distance of Farmland (km)** | | | | | |
| < 0.5 | 163 | 97.6 | 0.1 | 0.203 | 2.03 |
| 0.5 - 1 | 3 | 1.8 | | | |
| > 1 | 1 | 0.6 | | | |

From this study, it is identified that large portion (>95%) of respondents owned farmland less than 1ha (**Table 5**). The average land holding size per household was 0.45 ha with standard deviation 0.569. The CV was about 1.26% that indicates very low variability regarding the size of land holding in the study area (**Table 5**).

As it is observed in **Table 5**, about 97.3% of the respondents have farmlands that is situated less than 0.5km away from their residence with the mean distance of farmland from homestead was 0.1km. Most farmers managed better the nearer plot than distant plots due to the close observation of changes on nearer plots as well as the additional time and labor required to reaching distant plot (Fikru, 2009; Kiflemariam, 2008).

### 3.2. Livelihood aspects of the respondents

The findings of this study has indicated that almost all of the respondents depend on mixed farming including crop production and livestock rearing and some 25.1% involved in bee keeping. In terms of on-farming income, almost all of the respondent's sources of income were from food production while livestock rearing accounts for 94% of the respondents. About 25% of the respondents were depends on cash crop and bee keeping in the study area **(Table 6)**. The crop production is mostly rain-fed while livestock rearing largely depend on quantity rather quality. The finding of this study was consistent with the national report where by majority of communities were living in rural areas and three out of every four Ethiopians are engaged in agriculture, mainly in subsistence and rain-fed farming and livestock production and their daily income is limited (CSA, 2010).

**Table 7**. Livelihood activities and distribution of source of incomes of the sample respondents

| Activities | On farm activities | | On- farming income | | Non- farming income | |
|---|---|---|---|---|---|---|
| | Frequency | % | Frequency | % | Frequency | % |
| Crop production | 167 | 100 | 167 | 100 | | |
| Livestock rearing | 157 | 94 | 157 | 94 | | |
| Bee keeping | 42 | 25.1 | 42 | 25 | | |
| Petty trade | | | 42 | 25 | 12 | 7.2 |

Non-farming activities are other source of income for smallholder farmers and that mostly help to finance cash deficit or to fill gap of assets demanded by rural farm households (Degefa, 2005). However, in the study area only 7.2% of the respondents were depend on small scale (petty) trade. Generally, the sources of livelihood income were largely from on-farm source while small portion come from non-farm income (**Table 6**).

**3.2.1. Major crops cultivated by sample respondents**

The findings of this study has showed that about 33.5% of the sample respondents answered pulses (pea, beans) were the dominant crop cultivated in *dega* kebele (Gozo-bamush),while maize, sorghum and teff were grown in Mada-kuiel and Tarcha zuria kebele (*woina dega and kolla*) (**Table 7)**.

**Table 8.** Distribution of the dominant crops cultivated by sample respondents

| Crops cultivated in the area | Sample Kebele | | | | | | Total | % |
|---|---|---|---|---|---|---|---|---|
| | Gozo-bamush | | Mada-kuiel | | Tarcha-zuria | | | |
| | F | % | F | % | F | % | | |
| Pea | 56 | 33.5 | - | - | - | - | 56 | 33.5 |
| Bean | 56 | 33.5 | - | - | - | - | 56 | 33.5 |
| Wheat | 56 | 33.5 | - | - | - | - | 56 | 33.5 |
| Barely | 56 | 33.5 | - | - | - | - | 56 | 33.5 |
| Maize | - | - | 65 | 39 | 46 | 28 | 111 | 65.5 |
| Sorghum | - | - | 65 | 39 | 46 | 28 | 111 | 65.5 |
| Teff | - | - | 65 | 39 | 46 | 28 | 111 | 65.5 |
| Banana | - | - | - | - | 46 | 28 | 46 | 28 |
| Cabbage | 56 | 33.5 | 65 | 39 | - | - | 121 | 72.5 |
| Pumpkin | - | - | - | - | 46 | 28 | 46 | 28 |

Pulses were crops cultivated in *dega* agro-ecology. Such types of crops are essential to maintain soil fertility because they have ability to hide bacteria in their roots, which form nodules (Innes, 1997)**.** This finding shows the presence of slight variations in FLMPs due to agro-ecological influence in the study area.

**3.2.2. Livestock ownership of the respondents**

Another important component of the farming system in the study area is livestock rearing. Livestock ownership in Tropical Livestock Units (TLU) ranges from <0.5 to >20 (Akililu, 2006) (**Table 8**). Nearly 48.5% owned 6-10 TLU, while about 25% owned <0.5 TLU.

**Table 9.** Distribution of livestock ownership by sample respondents

| Tropical Livestock Unit | Respondents | |
|---|---|---|
| | Frequency | % |
| <5 | 42 | 25.1 |
| 6-10 | 81 | 48.5 |
| 11-15 | 25 | 15 |
| 16-20 | 12 | 7.2 |
| >20 | 7 | 4.2 |
| Total | 167 | 100 |

As one of the key informant viewed number of livestock in the study area has reduced soil fertility due to over grazing emanating from shortage of grazing land. This further aggravated soil infertility and soil erosion. Such erosions contribute to soil erosions as indicated by Kumela (2007).

### 3.3. Farmer's Perceptions on the Effects of Major Types of FLMPs

#### 3.3. 1. Perception in the Effects of Agronomic Practices

**Table 10.** Perception of sample respondents on the effects of agronomic practices on FLMPs

| Types | Effects of agronomic practices | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | V. G | | Good | | Fair | | Poor | | Unsatisfactory | |
| | F | % | F | % | F | % | F | % | F | % |
| Intercropping | 58 | 34.7 | 37 | 22.2 | 33 | 19.8 | 38 | 22.8 | 1 | 0.6 |
| Diversification | 55 | 32.9 | 32 | 19.2 | 40 | 24 | 39 | 23.4 | 1 | 0.6 |
| Using of hybrid seeds | 54 | 32.3 | 31 | 18.6 | 37 | 22.2 | 45 | 26.9 | - | - |
| Weeds & insect control | 10 | 6 | 14 | 8.4 | 54 | 32.3 | 80 | 47.9 | 9 | 5.4 |

*F = Frequency, V.G = Very Good*

This study has revealed that many of the sample respondents in the study area have positive attitudes regarding the effects of agronomic practices like intercropping, diversification and use of hybrid seeds on FLMPs. However, about 47.9% of the respondents answered poor for weeds and insect control which may be related to both internal (farmer centered) and external (chemicals used to control weeds and insect pests, their costs, etc. centered) factors that also need further study to come up with proper recommendations (**Table 9**). Thus, proper remedial actions should be taken to overcome such prolonged attitude and perception regarding these agricultural inputs in the study area.

#### 3.3.2. Perception on the Effects of Soil and Water Conservation Practices

**Contour plowing** is practiced by many of the farmers in the study area. It is practiced especially in the rainy season to minimize the energetic down ward flow of streams and thereby reduce soil erosions. To minimize this impact farmers plow their farms by varying inclination of the furrows from different direction (Akililu, 2006)**.** According to DAs in the study area, farmers don't construct the structures based on the slope of the farmland. There are also problems of structural quality that in turn results in low efficiency of these structures to protect soil erosions in the area.

**Division ditches** are a narrow channel dug to carry water and prevent haphazard flowing of runoff over farm plots and prevent water logging according to the MWARDO experts. On this issue, about 43.7% and 7.2% of the respondents were said it is very good and good respectively (**Table10**).

**Table 11**. Perception of effects of physical soil and water conservation practices

| Types | Effects of physical practices | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | V.G | | Good | | Fair | | Poor | | Unsatisfactory | |
| | F | % | F | % | F | % | F | % | F | % |
| Contour plowing | 77 | 46.1 | 11 | 6.6 | 35 | 21.5 | 38 | 22.7 | 6 | 3.6 |
| Division ditches | 73 | 43.7 | 16 | 9.6 | 32 | 19.3 | 44 | 26.3 | 2 | 1.2 |
| Terracing | 74 | 44.6 | 14 | 8.4 | 38 | 22.7 | 38 | 22.7 | 3 | 1.8 |
| Soil bund | 74 | 44.6 | 14 | 8.4 | 32 | 19.3 | 39 | 23.3 | 8 | 4.8 |
| Fanyajuu | 74 | 44.6 | 19 | 11.4 | 33 | 19.9 | 40 | 23.9 | 1 | 0.6 |
| Stone bund | 74 | 44.6 | 12 | 7.2 | 35 | 20.9 | 36 | 21.4 | 10 | 6 |

*V.G = Very Good, F= Frequency*

**Fanyajuu**: - is an embankment constructed by throwing the soil dug from basin to uphill (Lakew et al., 2005).The average size of this was length is 10m, height 50cm and its spacing depends on slope. These were also practiced in both sample Kebeles of the study area to control soil erosion.

**Soil bund** is an embankment constructed from soil along the contour adjoined with water collection or basin at its upper side (**Fig. 2)**. It is constructed by throwing soil dug from basin down slope. It is used to control run off and erosions from cultivation fields by reducing velocity of runoff (MoA, 2010). Its length is 10m, height 50cm and its spacing depends on slope. Based on this idea soil bund were one of the FLMPs that farmers applied in their farmland to control soil erosion in all sample Kebeles of the study area.

**Fig.2**. Soil bund at the Gozo-bamush kebele; *Source*: Own survey, 2014 (captured at 10:00 AM)

Terracing controls erosion by shortening the length and minimizing the gradient of the ground slope. According to Kebele $DA_S$, it enables a farmer to minimize soil and water loss through facilitating water percolation. Moreover, as one of the MWARDO expert revealed physical SWC in the area were partially practiced few years back. However, low quality of structures, destruction of the structures by human and animals and absence of planting trees in front of the structures were identified as the problems.

**3.3. 3. Perception in the effects of Soil Fertility Management Practices (SFMPs)**

As it can be observed from **Table 11,** the perception of the respondents were very good on $SFMP_S$, such as manure (41.3%), crop rotation (31%), fallowing (32.9%), inorganic fertilizers (35.3%) among others, while about 57.5% and 37% of $SHH_S$ answered poor on the effects of application of lime and legumes cropping. Thus, the poor effects from this $SFMP_S$ may be improved by proper intervention of concerned bodies for the small scale farmers in the study area.

As it was also identified from $FGD_S$ and the key informants some farmers had the tradition of applying manures, crop rotation, fallowing and compost. However, due to shortage of farmland majority of farmers' doesn't apply crop rotation and fallowing in recent years.

**Table 12.** Perception on the effects of soil fertility management practices

| Types of SFMP | Effects of SFMP | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | V.G | | Good | | Fair | | Poor | |
| | F | % | F | % | F | % | F | % |
| Manure | 69 | 41.3 | 54 | 32.3 | 20 | 12 | 24 | 14.4 |
| Crop rotation | 52 | 31.1 | 43 | 25.7 | 39 | 23.3 | 33 | 19.8 |
| Legumes cropping | 27 | 16.2 | 39 | 23.3 | 39 | 23.3 | 62 | 37 |
| Crop residues | 47 | 29 | 55 | 32.9 | 27 | 16.2 | 38 | 22.7 |
| Fallowing | 54 | 32.9 | 45 | 26.9 | 31 | 18.6 | 37 | 22.2 |
| Compost | 41 | 24.5 | 58 | 34.7 | 32 | 19.2 | 36 | 21.6 |
| Inorganic fertilizers | 59 | 35.3 | 40 | 23.9 | 33 | 19.8 | 35 | 21 |
| Application of lime | 7 | 4.2 | 26 | 15.6 | 38 | 22.7 | 96 | 57.8 |

*V.G = Very Good; F = Frequency*

On the other hand, the application of lime and legumes cropping practices were not more adopted method and are practiced only by small number of farmers. Regarding the use of inorganic fertilizers, the key informants revealed that using fertilizers is good but some farmers underlined the expensive price of these inputs are beyond the capacity of some farmers. However, some other doesn't share this view and practices at the current time.

**3.3.4. Perception in the effects of biological practices**

According to the perception of $SHH_S$ on the effects of biological FLMP about 71.9% and 52.9% of the respondent replied as it has a very good effects, while 25.7% and 47.9% answered the effects were good in planting trees and wind break respectively (**Table 12**).

**Table 13.** Perception of effects of biological $FLMP_s$

| Biological FLMP | Scale | Frequency | Percentage |
|---|---|---|---|
| Planting tree | Very good | 120 | 71.9 |
| | Good | 47 | 28.1 |
| Wind break | Very good | 88 | 52.7 |
| | Good | 79 | 47.3 |

As $FGD_S$ indicated, biological $FLMP_S$ in Mareka District has long history of practices. Native trees (such as *Tid, Wanza*, etc.) were planted for long time in the area, but the trees such as Sesbania and Elephant grass (*Zehone sar* (**Fig. 3**)) are newly introduced plants practiced in the area. In both SKA planting trees and wind breaks are promoted soil fertility, erosion control and a diversified source of income in the study area.

### 3.4. Challenges of Farmland Management Practices

The findings of this study has indicated that the major challenges of FLMPs identified in the study area include poor arable land management and population pressure answered by almost all of the SHHs, followed by deforestation by 98.8%, culture and overgrazing by 94% while lack of awareness by 93%, of the respondents. Generally as to respondents poor arable land management, population pressure, deforestation, culture, over grazing, lack of awareness, topography**,** poverty and soil erosions were the challenges for FLMPs in the study area respectively (**Table 13**).

**Fig.3**. Elephant grass amid soil bund at Mada-kuiel Kebele

According to FGDs the ever increasing of population growth is believed to be a major cause for deforestation especially in need for fuel and farmland. The increased need of farmland led by population pressure further exacerbated soil erosions and thereby loss of soil fertility. On the study area, majority of the sample respondent's plot is found on the steep slope, which is vulnerable to erosion. The use of wood and other biomass for fuel and the expansion of agriculture into forested areas fostered a high rate of deforestation and ultimately stripped the land of vegetative biomass exposing it to high levels of soil erosion. Poor arable land management in the study area like continuous cultivation of the land without any improvement in land management and farming practice has led to severe soil erosion.

**Table 14.** Distributions of major challenges and prospects of FLMPs (No of SHHs = 167)

| **Challenges of FLMPs** | **Frequency** | **Percentage** |
|---|---|---|
| Poor arable land management | 167 | 100 |
| Population pressure | 167 | 100 |
| Deforestation | 165 | 98.8 |
| Culture | 158 | 94 |
| Over grazing | 157 | 94 |
| Lack of awareness | 156 | 93 |
| Topography | 140 | 83.3 |
| Poverty | 131 | 76.5 |
| Soil erosion | 123 | 73.7 |
| **Prospects of FLMPs** | | |
| Good government policies | 158 | 94.6 |
| Availability of extension service | 161 | 96.4 |
| Good attention have given by the government | 163 | 97.6 |
| The presence of scaling up of best practices | 165 | 98.8 |
| Establishment of FTC | 164 | 98.2 |

*Source: Own survey, Dec 2014*

In the study area overgrazing results when livestock density becomes excessive and too many animals are grazed at the same area of rangeland, leading to degradation of vegetation and the compaction and erosion of the soil. Livestock pressure and poor stock management (mainly based on the free grazing system) are other major sources of land degradation.

### 3.5. Prospects of Farmland Management Practices

According to the perception of the sample respondents, there are positive prospects regarding the FLMPs. The opportunities include, the presence of scaling up of best practices (by 98%), establishment of FTC (by 98.2%), good attention have given by the government (by 97.6%), availability of extension services (by 96.4%), and good government policy (by 94.6%) of the SHHs answered respectively (**Table 13**).

One of the MWARDO experts stated that for future have good opportunities through application of FLMPs and thereby improve soil fertility and productivity in the study area. Additionally during FGDs farmers revealed today good opportunities are there, but the problem were applications of those opportunities in the study area such as establishment of FTC, good attention have given by the government of EPDRF, availability of extension

services. This may need further study in relation to the proper planning and implementation of the opportunities expected in the near future.

## 4. CONCLUSIONS

In general FLM problems are serious problems in the study area suggesting a need to give due attention for natural resources management in general and farmland in particular. The results of the study has revealed that FLMPs are influenced by multiple factors; family size, educational status, livelihood activities and income. During field survey, it is indicated by almost all of the respondents that they practiced either one or all of the FLMPs in the study area. However, there were many problems to this practices like low structural quality, damaging the structures by humans and animals, shortage of monitoring and evaluation by concerned bodies (farmers, DAs, etc.). Hence, the sustainability of these practices could not be maintained and that in turn led to soil erosions, loss of soil fertility and land degradation in the study area. Poor arable land management, population pressures, deforestation, culture, over grazing, lack of awareness, topography, poverty, agro-ecological variations, topography and slope were the major factors that influence the practice of FLMPs.

Therefore, the government and other stakeholders should work closely on the issues and its consequences. A type of measures that should be taken to improve the status of FLMPs include monitoring and evaluation, developing alternative energy sources, conservation oriented crop combination land management (agronomic, biological, physical and biological), afforestation, agro-forestry, adequate training in FTC, access to information and controlling the population growth are essential by using the current opportunities of FLMPs such as good government policies, availability of extension services, the presence of scaling-up of best practices.

## 5. REFERENCES

Emmanuel K.B., 2014. Food security in Africa: Challenges and prospects. University of Ghana, Accra.

World Bank, 2014.Overview of Ethiopia population. World Bank, Washington DC, USA

Hurni H, Solomon Abate, Amare Bantider, Berhanu Debele, Ludi E, Portner B, BirruYitaferu, and Gete Zeleke. 2010. Land degradation and sustainable land management in the Highlands of Ethiopia. *In*: Hurni H, Wiesmann U, editors; with an international group of coeditors. Global Change and Sustainable Development: A Synthesis of Regional Experiences from Research Partnerships. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North South, University of Bern, Vol. 5. Bern, Switzerland: GeographicaBernensia.

Genene Tsegaye, 2014. Review on Overall Status of Soil and Water Conservation System and Its Constraints in Different Agro Ecology. Hawassa, Ethiopia.

Teklu Erkossa and Gezahegn Ayele, 2003. Indigenous knowledge and practices of soil and water management in east Wollega, Ethiopia (MA thesis) unpublished. Addis Abeba, Ethiopia.

Pender, J.F. Place and S. Ehui (editors), 2006. Strategies for sustainable land management lesson from the east African Highlands, *International Food policy Research institute and word Bank*, Washington DC.USA.

Teshome Tafa, 2010. Land Tenure and Land Management Projects in Developing countries, Nature of Property units: Case study of Two Pilot Projects, Ethiopia, FIG Congress 2010, Facing the Challenges – Building Capacity, Sydney, Australia.

Berry, L., 2003. Land Degradation in Ethiopia: Its Extent and Impact. Commissioned by Global Mechanism with support from the World Bank, (https://rmportal.net/library/content/frame/land-degradation-case-studies-03-ethiopia/at_download/file. Retrieved in August, 2015).

Kumela Gudeta, 2007. Land Degradation and Adoption of Water Conservation Technologies in Ethiopia: A Case Study of Tehwedez District, South Wollo, Amhara National Regional State, Ethiopia, MA Thesis, Department of Geography and Environmental Studies (Unpublished), Addis Ababa University, Addis Ababa.

Mulugeta Debele, 2007. Soil Degradation and Conservation Practices at Grass root Level: The Case of Wuchale District, Oromia Region, MA Thesis, Department of Geography and Environmental Studies (Unpublished), Addis Ababa University, Addis Ababa.

MoA (Ministry of Agriculture), 2010. Ethiopia's Agricultural sector Policy and Investment frame work. Addis Ababa, Ethiopia.

MWARDO (Mareka *Woreda* Agriculture and Rural Development Office), 2013.Second quarter report (Unpublished). Tarcha, Ethiopia.

FAO (Food and Agricultural Organization)/UNDP/ETH, 1983. Land use planning and regulatory department of Ethiopia.

CSA (Central Statistical Authority), 2010. Result at national level statically report CSA, Addis Ababa, Ethiopia.

Yamane Taro, 1967. How to determine sample size? University of Florida IFAS extension.

Kiflemariam Yohannes, 2008. Farmer's perspectives of land Degradation and (PADETS) Contribution to Sustainable land Management: The case of Gozamen District, Amhara Regional State, MA Thesis, Department of Geography and Environmental Studies (Unpublished), Addis Ababa University, Addis Ababa.

Degefa Tolossa, 2005. Rural livelihoods, poverty and food insecurity in Ethiopia: A case study at Erenssa and Garbi communities in Oromiya Zone, Amhara National Regional State, PhD Thesis, Norwegian University of Science and Technology, NTNU, Trondheim.

Innes, D.Q., 1997. Intercropping and scientific basis of traditional agriculture. Intermediate technology, London.

Fikru Assefa, 2009. Assessment of adoption behavior of soil and water conservation practices in the Koga watershed, high lands of Ethiopia. Cornell University.

Akililu Amsalu, 2006. Caring for the Land: Best Practices in Soil and Water Conservation in Beressa Watershed, Highlands of Ethiopia: [Doctoral Thesis]; Wageningen University, p. 149.

Lakew D., Carucci V., Asrat W. and Yitayew A., 2005. Community Based Participatory Watershed development: A Guideline; Ministry of Agriculture and Rural Development, Addis Ababa, Ethiopia.