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Livelihood Contributions of Moringa Tree based Agroforestry Practices in Konso District, Southern Ethiopia

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Abstract
Agroforestry is praised for its benefit in balancing economic and environmental goals although its economic advantages over monocropping are not well documented for most agro-ecology and practices. This study was carried out to investigate livelihood contribution of the practice. The study employed focus group discussion, key informants interview, and household survey for data collection. The data obtained via these techniques were analyzed by using descriptive statistics and livelihood impact analysis. The livelihood contribution analysis showed that there is significant difference in livelihood status of Moringa Tree Based agroforestry users compared to the non users. In general, the moringa tree based agroforestry practice is superior for its social, economic and environmental benefits than monocropping system. Above all, it is the land use system recommendable in the area, where the problem of inhospitable, harsh and vulnerable environments, challenging landscape, fragile soil susceptible to erosion and highly variable rainfall is very pressing. Therefore, the government and other responsible bodies should support smallholder farmers in the area in order to use moringa tree based agroforestry land use for sustainability of smallholder agriculture that has been constrained by inhospitable, harsh and vulnerable environments, challenging landscape, fragile soil susceptible to erosion and highly variable rainfall.
Keywords: Agroforestry practices, Smallholders and livelihood

1. INTRODUCTION

1.1. Background

The use of agro forestry for soil conservation in one way and for livelihood supporting strategy in another way is the most widely attention getting activity in southern part of Ethiopia (Yeshambel, 2013) including the study area Goc'ha. There are different types of small and big trees inside and around the farm land of Goc'ha. The farmers in the area harvest variety of crops throughout the year. These unique mixed agriculture practices enabled them to cope up the climate change impacts during unpredictable environmental conditions (Forch, 2003). The best example in the area is the cabbage tree *Moringa Stenopetala* (locally also called to be Moringa). Other tree species in the area are: *Terminaliabrowenii, Juniperusprocera, Euphorbia, Oleaafricana, Ficussori, Cordiaafricana, Sterculiaafricana, Acacia Abysinica* and others. Among the crops cereals mainly sorghum followed by maize which are intercropped with pulses (beans and peas varieties), tuber and root crops (yam, cassava, sweet potato and yam), oil crops, fibers, citrus plantations, stimulant crops (coffee, chat and tobacco) are very common.

In Konso, moringa is multipurpose tree used to fill gaps associated to drought impacts; used for shade; and it has a very high nutritional advantage. Its leaves are served as the main diet as well as medicine for various diseases. It is seen as an important insurance against crop failure. Culturally the tree is taken as a dowry or measure of wealth as how many of these trees the bridge groom has in the garden or nearby farmland to feed his/her family. Even though not well documented, agroforestry practices increased income opportunities, economic stability, reduced cost of production, increased ability to manage sustained yield and improved the livelihood of the farmers in the area.

1.2. Statement of the problem

Moringa tree based Agroforestry practice is one of the strategies that seeks to reconcile the dual goals of forest conservation and improving livelihoods for the local communities in areas like Konso. Therefore, Konso people developed indigenous, integrated farming practice (agroforestry) observed nowhere else in Africa (Forch, 2003). As one of the study areas in Konso, the study area Goc'ha had started Moringa tree based agroforestry practice intervention many centuries before in a better and interesting way than everywhere else.

However, detailed data were not available to substantiate the claims and to scale up the practice within study area and from the study area to other similar areas. Without a formal study and hard facts and figures, the technical and economic benefits generated by the practice may remain unknown. Therefore, the livelihood contribution assessment study was required.

1.3. General objective

The general objective of this study was to assess the livelihood contributions of moringa tree based agroforestry practices in Konso woreda, Segen Hizboch zone, SNNPR, Ethiopia.

2. RESEARCH METHODOLOGY

This chapter has two sections. The first section is about the description of the study area. In the second section the site and sample size selection, data collection and data analyzing methods are presented.

3.1. Description of Study area

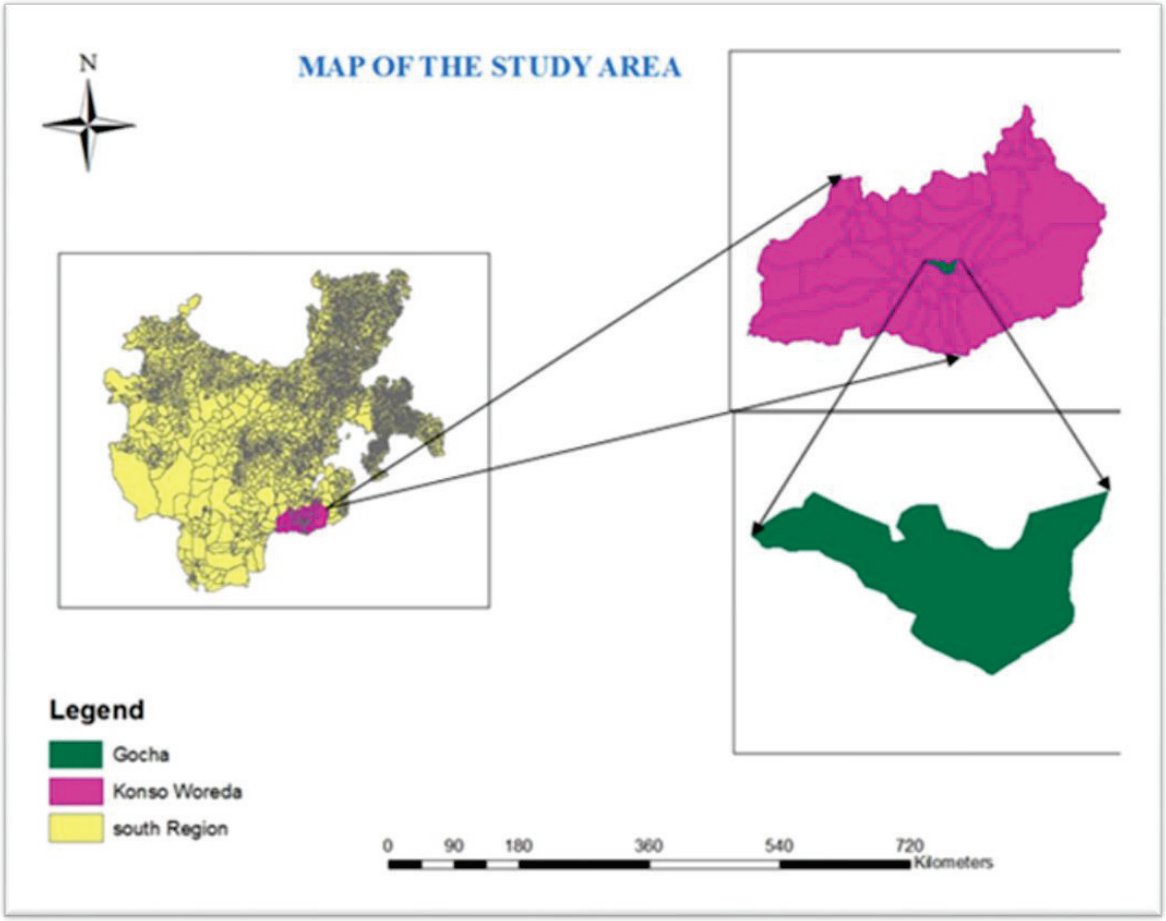
3.1.1. Location of the study area

Konso woreda is one of the woredas in Segen Hizbcoh zone in the Southern Nations, Nationalities, and Peoples Region (SNNPR) of Ethiopia and covering the area of 202,286 hectare (CSA, 2007).

Konso woreda is known for its religious traditions, *waga* sculptures, and nearby fossil beds (the latter is an archaeological site of early hominids). The site was added to the UNESCO World Heritage Tentative List on September 30, 1997 due to its purported universal cultural significance and officially made a World Heritage Site in 2011 (UNESCO, 2011).

This woreda is located in the Great Rift Valley; it is located at 50^0 15′ N latitude and 37^0 30′ E longitude, South of the capital, Addis Ababa and is bordered on the south by the Oromia region, on the west by the Weito River which separates it from the Debub Omo zone, on the north by the Dirashe, on the northeast by Amaro, and on the east by Burji. The Sagan River, which flows south then west to join the Weito, defines part of the woreda's boundary with Burji and the entire length of the boundary with the Oromia Region. The administrative center is Karati; other towns in Konso include Fasha and Sagan (Engels, 1990).

Figure 1: Map of the study area



3.1.2. Demographics

Population

Based on the 2007 Census conducted by the Central Statistical Agency of Ethiopia (CSA), the total population of Konso woreda is 235,087. Out of which 121,675 are female and 113,412 are male. In terms of gender composition, the female population of the area is slightly higher than the number of male population. With an area of 2,273.79 square kilometers, Konso has a population density of 103.39; 9,415 or 4.00% are urban

inhabitant. A total of 44,902 households were counted in this woreda, which results in an average of 5.24 persons to a household, and 43,535 housing units (CSA, 2007).

Ethnic groups

The two largest ethnic groups reported in Konso were the Konso (87.04%), and the Gawwada (9.79%); all other ethnic groups made up 3.17% of the population (CSA, 2007).

Language

Konso was spoken as a first language by 86.18% of the inhabitants, 9.73% spoke Gawwada, 2.08% spoke Oromiffa, and 1.26% spoke Amharic; the remaining 0.75% spoke all other primary languages (Population and Housing Census of Ethiopia, 2007).

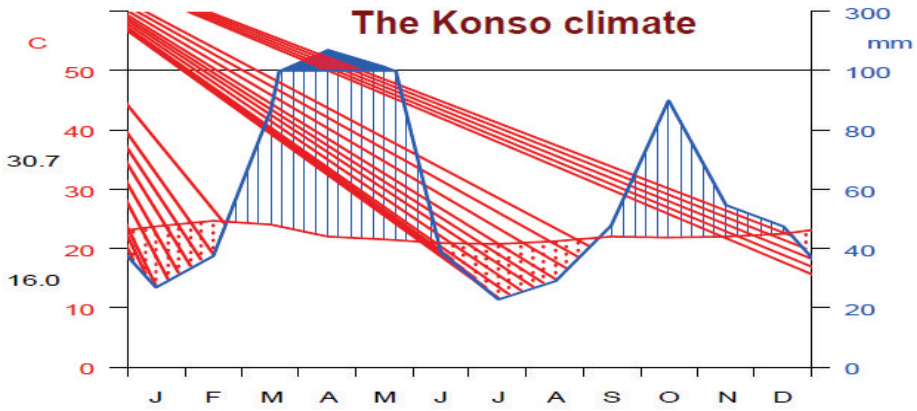
Religion

The majority of the inhabitants follow the Protestant (50.34% of the population), while 34.62% of the populations were traditional religions followers, and 13.81% were Orthodox Christianity followers (Population and Housing Census of Ethiopia, 2007).

3.1.3. Topography and climate

Two economic zones that are distinguished by differences of altitude and economic exploitation dominate the physical landscape of the woreda. These are semi-arid lowland areas supporting the majority of the population (between 60-70 percent); and agricultural uplands in the middle altitude supporting the rest of the primarily cultivating population. The type of rain fall is bimodal type. The long rainy season occurs between March and May and the short during September and November (Watson, 2009). The rain fall ranges from 300-900mm per annum and the temperatures vary from 15 - 33 O^c (Jahn, 1991). Main agricultural area ranges from 1400m-2000m a.s.l (Forch, 2003).

Figure 2: The climate of Konso



Source (Forch, 2003)

3.1.4. Land use

The native Konso indigenous land use practice is a distinct and sustainable form of agriculture that involves the building and maintaining of stone terraces, and fertilizing the fields with manure. A central feature of their fields is the endemic tree crop, Moringa stenopetala. They also use their land for the main crop sorghum, along with some tuber and root crops (yam, cassava, sweet potato and taro) and cotton (Yeshambel, 2013). According to the woreda agricultural and rural development office, agricultural land still accounts for the largest share of the land use in the area.

3.1.5. Means of livelihood and sources of income

The Konso people live in inhospitable harsh and vulnerable environments. They live in terrain characterized by stony steep slopes (challenging landscape) which is very fragile susceptible soil to erosion (Forch, 2003). The rain fall is highly variable rainfall with high variation from the mean. This signifies degree of unreliability of rainfall (Watson, 2009).

They are known to live isolated for many years (Forch, 2003). Fear of insect born diseases like malaria, tsetse fly and other insect bites in the lowlands and the frequent violent with their neighbours (Borena, Guji, Tsemai, and Dirashe people) forced them to be restricted in mountain top (Watson, 2009).

Because of these aforementioned causes, the Konso people developed indigenous, integrated farming practice observed nowhere else in Africa. That is the heavy impact of rainfall shortage, Challenging landscape and fragile soil forced them to use indigenous soil and water conservation strategy; the unreliable rainfall and arid environment triggered them to identify selected drought resistant species and varieties to be grown on the same plot; and the climate variability, poor soil fertility, less production inspired them to integrate homestead husbandry with agro- forestry and mixed cropping (Forch, 2003). The practices have been maintained for

hundreds of years despite the social Changes (Tadesse, 2010; Watson, 2009; Forch 2003).

The crop, livestock and tree integration has great synergism to cope up climate change susceptibility in Konso as their livelihood strategy. That is agroforestry and animal husbandry are the peculiar features of the Konso farming system (Tadesse, 2010). The largest number of livestock is kept in homesteads (Beshah, 2003).

Livestock is handfed from harvests of agro-forestry and mixed agriculture. Unlike other parts of Ethiopia, dung is never used as fuel. The manure is collected and periodically applied to the fields (Forch, 2003).

The most commonly used fodder tree and shrub in order of importance include: *Terminalia Stenopetala, Rhus natalenis, Acacia asak, Balanites aegyptica, Cordia Africana, Cajanus cajan, Berchemia discolor, Ehretia cymosa and Ficus spp.* (Tadesse, 2010). *Terminalia Stenopetala* provides the largest portion of livestock feed (over 90%) at any period particularly during the long dry periods (Tadesse, 2010).

The integrated crop-livestock system has enabled them to minimize risk of exposition to climate change effects. Farmers identified about thirty different tree and shrub species whose leaves, roots and fruits are being traditionally used as food (Tadesse, 2010). The cabbage tree, *Moringa Stenopetala*, is a multi-purpose tree used to fill gaps associated to drought impacts. It is seen as an important insurance against crop failure. Culturally, the tree is taken as a dowry or measure of wealth as how many of these trees the bride groom has in the garden or nearby farmland to feed his future family.

Field crops are mainly used for house hold consumption. Sorghum, teff, pejian pea and horse bean are the major field crops grown in the area. Cash crops such as chat and coffee are also growing in the area. Shoat and cattle are the common Livestock in the area. The sources of cash income for the people in the study area include trees, crops, livestock, and other non-timber forest products. The cash crops chatt and coffee are exclusively for income. Few of the households also earn their income from petty trading and daily labor.

3.2. Site selection, sampling technique and methods of data collection

3.2.1. Site selection and sampling techniques

Konso woreda was selected purposively based on the presence of Moringa-tree based agroforestry practice. From the woreda, Goc'ha, Sorobo and …… kebeles were selected also purposively based on the presence of Moringa-tree based agroforestry practice after discussion with the woreda agricultural office experts. The sample size was determined based on the formula provided by (Yemane, 1967). That is:

$$\text{The sample size } (n) = \frac{P(1-P)}{I^2}$$

Where, 95% degree of confidence is selected in the study. I converted the confidence level to a Z score which is 1.96 and confidence interval 5%. I expected 50 percent o respondents to respond affirmatively since such kind of research is never conducted previously in the area, 0.5 would be the proportion.

I computed the needed sample size by plugging the values into the above formula, where Z is the Z-score, P is the proportion and I is the confidence interval.

Based on this formula the sample size was = (1.96)2 * 0.5 (1-0.5) / (0.05)2 = 384; but due to time and resources constraints I have determined the sample size to be 155 (one hundred fifty five). Out of the total 155 sample households, 78 were MTBAFP users and 77 were monocroping system users. The households were selected by following simple random sampling[1] techniques after categorizing the whole population as MTB agroforestry practice users and monocroping system users. SRS is the simplest form of probability sampling. Each population element of SRS has a known and equal chance of selection. Only the head of the household were considered for household interview as the head of the household is the owner of the land and the decision-maker on most affairs of the household.

3.2.2. Data Sources and Data Collection Methods

In this study both primary and secondary data were used. Primary data were collected through a household survey, focus group discussions, key informant interview, field observation, and biophysical resource and market assessment methods. Secondary data like the number of households in each kebele and socio-economic information were taken from the agricultural office of Konso woreda. Different offices and personal contacts were also made to obtain additional information.

I. Preliminary survey

An initial discussion has been held with the Agricultural development agents (DAs) of the woreda to explain the purpose of the survey and get permission to conduct the study in the area. Based on the information generated from the discussions at various levels sample kebeles, (Goc'ha) and the other two kebeles, where moringa tree based agroforestry adopters are dominant, were purposively selected for the study out of the whole rural kebeles in the woreda. In the same way discussions have been held in the selected Kebeles and through these discussions, the same number of both agroforestry practice participant and none participant farmers were selected.

[1] Sampling refers to drawing a sample or selecting a subset of elements from a population

II. Key informant interview

At each kebele level, fifteen key informants including experts, who have deep knowledge of the area, were used to gain an overview of the evolution of vegetation cover changes, moringa tree based agroforestry practices, other important points such as benefits, labour requirement by each component, life span, maturity age of each component of practices and all other necessary data in line with objectives of this study. The information obtained during key informant interview was also used in the development and modification of questionnaires that has been employed for formal household survey. Key informants with their long residence, better acquaintance with the local farming system, good knowledge in, and ability to articulate the functioning of moringa tree based agroforestry system, and who have lived continuously in the area for 15 and more years has been selected here.

III. Focus Group Discussion

After the introductory meetings and the identification of agroforestry practice participant and non participant farmers[1], three focus group discussions in each kebele have been conducted and ten persons in each group were involved in group discussion. A separate informal discussion was also held with extension workers so as to make triangulation and validate the information given by different groups.

IV. Household survey

List of all household heads of the selected kebeles was collected from the kebeles' administrators and development agents. A simple random sampling technique was employed to obtain the representative samples of individual households from the listed household heads in the selected kebeles. The randomly selected one hundred fifty five households from both agroforestry and monocropping system users have been interviewed by using the questionnaires which were developed and modified based on the information gathered during the focus group discussion and key informants interview. The questionnaires have been translated into Amharic language to simplify for the enumerators. The questionnaires have been also pre-tested using randomly selected farmers from the sampled households to evaluate whether they are prepared in the way that clarify communication between interviewers and interviewed. The necessary adjustments to the questionnaires have been then made before fully duplicating and distributing them to the enumerators. Three enumerators with Degree and diploma qualifications were selected from each kebele, trained and assigned to kebeles for data collection. Regular monitoring has been conducted by the researcher while enumerators were interviewing the respondents and daily evaluation of the filled questionnaires has been undertaken throughout the data collection processes.

Besides, observations have been also made to make insight understanding about the practice and to observe the aesthetic and other roles of agroforestry in the area.

V. Tree Inventory

In this case first the number of species existing in farm of sample households has been identified and finally the number of trees for each species has been counted by the enumerators. This was done to know the impact of diversity of tree species on income from Moringa tree based agroforestry practice.

Secondary data like the number of households in each kebele and socio-economic information were taken from the Agricultural Development office of Konso woreda. Different offices and personal contacts were also made to obtain additional information. Additional secondary data secured from the works of others on the impact, contribution and the role of agro forestry practices, experiences of other countries was also used.

3.3. Data analysis and interpretation

In this study descriptive data analysis technique has been used. The data generated through quantitative method was organized and statistical computations have been made. That is to analyze socio-economic characteristics of selected households and contribution of Moringa tree based agroforestry practice on farm households the simple quantitative analysis techniques such as mean, standard deviation, percentage and frequency distributions were employed. Finally the results have been summarized in a table form so that the analysis and meaningful interpretations of results have been made to draw conclusions and implications. The qualitative data collected through key informant interview, focus group discussion and physical observation has been narrated and summarized.

3. RESULTS AND DISCUSION

3.1. Contribution of MTBAFP

Impact is the effect, positive or negative, intended or not on individual households, institutions and the environment caused by a given development activity (Ibrahim, 2012). For the simplicity of this study we can see the livelihood impact of agroforestry practice in two major parts in the study area. These are both economic and social impacts.

[1] Non participant farmers mean farmers those who use mono cropping practice highly than AFP.

3.1.1. Economic contribution

Economic impact measures the combined production and income effects associated with a set of research and development activities (Ponniah and Martella, 1999 cited in Ibrahim, 2013). Most points regarding to economic issues of the system, such as profitability and income factors had been discussed in section 4.3 of this paper. As discussed in the earlier section, agroforestry land use systems, when compared to non- agroforestry land use system had a higher output value at the same resource cost and/or had the same output at lower resource cost. The economic impacts of agroforestry practice can be seen through impacts on households' cash income, livestock number, fuel wood, construction wood, human food and animal feed sources.

Contribution to cash income and livestock owning of households: The average total income earned from agroforestry practice is 28,843.88 birr and 12,126.25 birr from monocroping system in the same units of lands per sampled households. This was computed in the financial analysis part in section 4.3.1 (see table 18). The average income from livestock sale which is mainly due to agroforestry practice was 3977.04 birr for users and 2780.50 birr for non-users and the average income from crop is 4,903.25 birr for users and 2,547.54 birr for non-users. The result shows that there is statistically significant difference in terms of total income, income from livestock and income from crops at 1% level (see table 22).

Furthermore, results show that average income of users is much higher than non-users and taking into account only livestock income of households, then income of users is more than twice the income of non-users and the change in households income is more related to change in income of livestock. Though, there is no significant difference in terms of income from off/non-farm income. This result might be related to the unavailability of off/non-farm job opportunity in the study area.

Table 22. Components of income sources

Income sources	MTBAFP	Monocroping	Difference
Crop sale	4,903.25	2,547.54	2,355.71
Livestock sale	3,977.04	2,780.5	1,196.54
Saved money from fuel wood buying	3,711	1,250	2,461
Saved money from construction wood buying	4,958	1,375	3,583
Overall income from the practice	28,843.88	12,126.25	16,717.63

Source: own survey (2014)

Household energy (fuel) and construction wood source: Almost all agroforestry adopter households emphasized that they are dependent on firewood and crop residues for the fuel. 100% of agroforestry system practicing households reported that the improvement in fire wood supply and are self sufficient from farm trees where as the others who are not users of agroforestry practice are go far away for their firewood need. The result indicated that the dominant energy type in rural households is fuel wood and therefore there is need to integrate trees in the land use system. Agroforestry practicing farmers saved 3,711 ETB where as those of non users saved 1,250 ETB and the difference is 2,461 ETB, which is the comparative advantage of using agroforestry practice (table 22). This increased income level of farmers and had positive impact on their living standard. This supports the findings of Gregerson et al (1989) who concluded that farmers have to grow sufficient trees to meet their own fuel wood requirements and to regenerate surplus for sale. The amount of saved money from construction wood buying is 4,958 ETB for agroforestry user households whereas the monocroping system users' is 1,375 ETB showing the difference of 3,583 ETB (table 22).

In the study area livestock such as cattle and shoat are the main sources of livelihoods and income. Those, 100% of households have livestock. On an average of about 80.64%, 88.39% and 33.23% of the households sold their cattle, shoat and chicken respectively as shown in table 23.

Respondent of each livestock produce sold of users and non-users were presented. With a monetary value of cattle 6500 to 15,000 Birr, shoat: 550 to 2000 Birr, chicken 25 birr to 150 birr were sold. The results descriptive statics shows that, there is statistically significant difference between users and non-users in terms of cattle, shoat at 1% probability level. Thus, its indication shows that users of the agroforestry system of farming are earning better income from livestock compared to non-users.

Table. 23 Income generated from livestock sale

Livestock sold	Unit	Non-user			Users			Total			
		N	Mean	%	N	Mean	%	N	%	Mean difference	t-value
Cattle	No	57	1.22	36.77	68	3.46	43.87	125	80.64	2.24	0.33
Shoat	No	63	1.61	40.65	74	3.23	47.74	137	88.39	1.62	4.60
Chicken	No	21	0.54	13.23	31	0.97	20.00	52	33.23	0.43	3.32

Source: own survey (2014)

3.1.2. Social contribution

Social impacts are important and need to be considered along with the economic and environmental impacts. Social impacts assessment include the effects of intervention of the agroforestry practice on the attitude, beliefs, resource distribution, status of women, income distribution, nutritional implications, institutional implications etc. of the community.

Nutritional role: To measure the calorie intake computation of food calorie intake was made. The impact of Moringa based agroforestry practice on the households' nutrition status was measured using physical consumption of food. To do so, households were asked to report the kind and amount of food items consumed by their families in the last two weeks preceding the survey. Converting the data into calories adjusted for household age and sex composition involved a series of steps. First, different units of local measurement were converted into a common measure for each food item. Second, the acquisition of each food item was converted to calories using the food composition table compiled by the Ethiopian Health and Nutrition Researches Institute (EHNRI, 2000 cited in Ibrahim, 2012). Third, all food calories were added up and then converted to daily amounts. Finally, the aggregate food calories were adjusted in adult equivalent units (see Appendix 12 & 13) to make a meaningful household calorie intake.

Accordingly the average kcal/AE intake is 2787.36 for users and 2158.45 for non-users. There is statistically significant difference in terms of the household nutritional status of kilocalorie intake/ AE at 5% level. The USDA has fixed the average calorie requirement for Ethiopia at 2088 cal per day per adult equivalent. This is a very rough generalization, but a useful reference. On the other hand, technological change and commercialization of smallholder agricultural production improves the level of food consumption of participating households (von Braun and Kennedy, 1994). This is evident for this study as the moringa tree based agroforestry practice increases consumption of nutritional status of households.

The outcome variables for socioeconomic impact of moringa tree based agroforestry practice on households' livelihoods are presented in Table 24 below.

Table 24. The mean difference test of outcome variables for socioeconomic impact of MTBAFP on households livelihoods

Variable	Unit	Monocroping	MTBAFP	Difference
Calorie intake	Kcal/AE	1967.35	2901.02	933.67
Women work time	Hours	13.36	8.85	4.51
Child study time	Hours	1.32	2.98	1.66
Health expenditure	Birr	228.95	485.05	257
Education expenditure	Birr	125.45	330.68	205.45

Source: Own survey (2014)

Contribution to education and health: The average health expenditure is 485.05 birr for users and 228.95 birr for non-users and education expenditure is 330.68 birr for users and 125.45 birr for non-users. There is significant difference in terms of health and education expenditure. This result is similar with finding of Ibrahim (2012) whose finding was similar with this finding.

Role on women work and students study time: The average hours that women work per- days is 8.85 hours for users and 13.36 hours for non-users and children study is 2.98 hours for users and 1.32 hours for non-users. There is significant difference in terms of time worked by women and children study. This indicates that adoption of moringa tree based agroforestry reduces the burden on women and increased children study time. Previous research results on school time of children and work time of women revealed that providing services which are sustainable and replicable through the adoption of low cost, community managed simply applicable training technologies like agroforestry practice reduce the work load on women and children also improve education time of children (UNICEF, 1994a and UNESCO, 1985).

Other social contributions: The impact of Moringa tree based agroforestry practice on controlling social problems like migration and its aesthetic value is also considerable. Due to the created opportunity work through of agroforestry practice which is riskless the migration rate in the area is reduced. According to the results from focus group discussion there is no migration for the last three years. Moringa tree based agroforestry practice in Konso strengthens local institutions' capacity and performance. For example peoples who have number of

moringa tree has been given top position in Konso. 100% of the respondents said that they give top social position to those who have number of moringa trees mixed with other agroforestry tree species and crops. This issue has been also raised and strengthened by focus group discussion. According to focus group discussion result, in Konso, even to make marriage relationship between two families, the families of daughter who have been asked their daughter to marry someone ask the existence of moringa tree extremely. This shows how much the agroforestry practice plays social role. This result is similar with the result of Ibrahim (2012) who carried on the study on socio-economic impact of forage development on farm households' livelihood in Mieso district, West Hararghe zone of Oromia national regional state and revealed that forage development which is mainly related with agroforestry practice has significant role on strengthening institutions.

4. CONCLUSION AND RECCOMENDATION

This study was conducted at Konso woreda in Segen Hizboch zone of Southern Ethiopia to analyze the livelihood contribution of Moringa tree based agroforestry practice. Regarding to analyzing livelihood contribution the outcome variables include total household income from (livestock sell, crop sell, fuel and construction wood), social issue/welfare (expenditure on education, expenditure on health, nutrition status in kilocalorie intake per-AE, work load of women and study/school time of children.

The result of the descriptive analysis regarding to contribution shows that there is a significant difference in all the outcome variables between users and nonusers of Moringa tree based agroforestry practice which indicates an improvement in the livelihood of farmers participating in the system.

But the descriptive analysis show that average land size of household is less than one hectare (0.99 ha) in the study area. To increase agricultural production extensification is longer impossible in the area where shortage of land is the typical characteristics of the study area. Therefore, the government should support farmers by providing extensive extension service on the structure and function of the system and how to increase the productivity from the system. It would also be better to provide improved varieties of agroforestry trees with short maturity age in order to make farmers not switch from agroforestry practice and make agroforestry practice to serve the economic and environmental development goals.

In general the livelihood contribution of Moringa tree based agroforestry practice on the farm households' livelihoods is found to have a significant role on increasing households' income, reducing job burden of women, increasing students study time and increasing households' health expenditures showing that the importance of this practice in improving the livelihood of the poor farmers. Therefore government officials including the woreda administrative bodies should have to support and encourage the farmers to use this system of farming in better and improved way than ever before.

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