

**Gender Based Roles and Resource Use Right in
Potato Production and Marketing System: the
Case of Some Districts in Oromia, Ethiopia**



**Oromia Agricultural Research Institute (OARI), Bako Agricultural
Research Center**



**Organization for Social Science Research in Eastern and Southern
Africa (OSSREA)**

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Case of Some Districts in Oromia, Ethiopia**

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A research report

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OARI was established in 2001 with the objectives: to generate, develop and adapt agricultural technologies, and to coordinate research activities of agricultural research centers, higher learning institutes and others in Oromia National Regional State.

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EXECUTIVE SUMMARY

The current gendered project was executed as a continuation to "Participatory Potato Seed Multiplication and Distribution Project", which had been conducted during 1999 to 2002 by ASARECA/CIP financial assistance, in western Oromia, Ethiopia. The current project has been executed in western Oromia zones of East Wollega districts: Horro, Jimma Arjo and Jimma Rare, and West Shewa districts: Cheliya and Jeldu.

The main objective of the current project was to assess the roles and responsibilities of men, women, boys and girls, in overall gender roles in potato production and marketing systems in particular and in agriculture in general. Different types of tools: PRA, key informant interview, group discussion, activity profile and wealth ranking were employed to generate gendered information in study zones. However, formal household survey was conducted only in East Wollega Zone, in which "Participatory Potato Seed Multiplication and Distribution Project" had been carried out.

The study depicted that females involve in physical activities from the early age of their life as compared to men. Women also involve in work for a longer time, 16-18 hours as compared to 8-10 hours of men. Apparently men enjoy rest after farming while women engage in much drudgeries of household chores after farming.

As we observed from the roles and responsibilities in undertaking productive, reproductive and community roles, there have been tremendous variations between women and men. Rural women predominantly involved in drudgeries of household chores, besides participating in various livestock and crop production activities. Despite all these, the roles women play have never been give due attention and may be difficult to distinguish in terms of time and amount of contribution as they involve in quite several types of activities. Rural women have less decision making power in their household and in their communities. Women access to and control over of resources such as land, capital, livestock, trees, agricultural products and improved seed and fertilizer are very limited, and ultimately women systematically discriminated from some opportunities than men. The reasons attached to this are tradition, culture, religion, education, and economic differences.

Women involve in a number of agricultural activities. For instance the labour contribution of women in potato production can goes up to 73%, besides the house hold chores up to 61%, rearing of livestock up to 35% and overall crop production up to 22.5%. On the other hand, it was observed that even the agricultural expertise did not well recognize what gender role is or what contributions each household member made.

The study identified the problem of inappropriate land use, which led to land degradation, deforestation and economic pressure, which felt to exacerbate the women's work load as women are more responsible for household welfare than men. Therefore, there should be appropriate land use policy that encourages appropriate land use system of crop, livestock and forest plantation according to land capability classification. In line with this extreme land shortage has been noted in the highland areas of Jimma Arjo district, while correspondingly there is excess land in the low land areas of the district (Didessa valley). Therefore, there should be some mechanisms by which the landless farmers of highland areas could use or obtain use right of the open land that exists in the low land areas.

The existing working culture of the farming communities are intruded by traditions, religions and norms. Some religions prohibit men to engage in some types of physical activities while women involve in their duties. This working culture should change since most of the farmers do not engage in farming activities on certain local holidays that quite influenced by the operating religions in that areas. On the other hand, farmers suggested sustainable supply of improved seeds and fertilizers especially of potato that already set on like Menagesha variety and other crops variety to bring household food security and sustainable development.

In summary when only gender roles of household members are identified and enabling environment created, could tangible and sustainable development be realized. This is to say that human labour and resources would be efficiently utilized for social and economic development of a nation. Therefore, the study

recommends the understanding of the gender division of labour and access to resources before any new technologies or crop varieties are introduced. The study also recommends more labour saving productivity enhancing technologies and the promotion of agroforestry technologies at household level to save women's time that otherwise be spared for search of fuel wood and also to enhance soil fertility and offer options for fodder production.

1. INTRODUCTION

In Ethiopia, information concerning farm households' gender differentiated agricultural roles and responsibilities, access to and control over of resources and decision-making power is inadequate. Despite this fact, the information is predominantly fundamental to address gender equity client-oriented research and development technologies, to efficiently utilize human and natural resources. Above all, gendered information is vital to recognize women's role, the disadvantaged groups of people in a society to uphold their roles in economic development of the nation.

It is well known fact that in rural Ethiopian society women perform a number of productive, reproductive and community roles. But what so ever activities they run, it has not been recognized as useful and never valued as productive role. Hence, women's roles in Ethiopia society, especially of rural women's have been found invisible in spite of their enormous contribution for the welfare of the household and the community. Therefore, this study was intended to quantify and then bring to the recognition, the major roles women play in the rural farm household, their access to and control over of resources and decision making power status with particular emphasis to potato production and its related natural resources management. It is not only to generate their roles and responsibilities but also to know and document the influential factors spinning behind the roles and responsibilities that could be

tradition, culture, education, economy and health and sex differences, hence the specific objectives of the study were:

1. To examine social, economic and cultural factors that determines the access¹ to and control² over resources of the gender groups.
2. To investigate men and women (gender related) decision-making power on the production, processing, marketing and utilization of potato.
3. To understand the reason for none adoption or partial adoption of the disseminated potato production technology *vis-à-vis* the role of gender and social interaction.
4. To learn useful lessons of potato production constraints and opportunities for further research and development

¹ Access is defined as possibilities for participation, use and benefit.

² Control refers to domination, ownership and decision-making.

1.1 Background

Agriculture has been the cornerstone of Ethiopian economy, since time of antiquity. It is the main source of income and food for more than 80% of population dwelling in the rural areas. It also contributes more than 50% of the country's gross domestic product (GDP), 90% of raw material for local industries and it has been source of more than 50% foreign exchange earnings. Surprisingly, most of the people in the county are directly or indirectly dependent on land or agriculture, as the growth of other sectors, industry and services are by far low. It is also worth mentioning that the fundamental change of Ethiopian politics usually spins around land tenure system and agricultural performance.

According to Dessalegne (2003), over the last fifty years, rural poverty in particular has been severely growing in magnitude, and that the country's agriculture sector has been in structural decline. Recurrent incidents of mass starvation and high levels of livelihood as well as ecological vulnerability are evidences for this fact.

On the contrary, Ethiopia has diverse agro-ecology as well as suitable soils for cultivation of wide varieties of tropical and sub-tropical crops, and rearing of a number of livestock. By the same token it is the home for wide arrays of wild animals. Nonetheless, based on evaluation of past performance and present scenarios, one can judge the trend of progress of Ethiopian agriculture, which is converse to the alarming population growth rate. This resulted

from multifaceted and complex social, economical and political problems. On the other hand, agricultural research has been in operation in the country since 1950s. The main objective of the research is to generate improved technologies that impinge a positive impact on the life of rural community.

The Ethiopian Agricultural Research System has since many years been working on generating and transfer of agricultural related technologies. This was to promote agricultural based development in the nation. To effect its goal, the research system has been using various approaches and strategies: among the many others Farming System Research (FSR), and the recent one Client Oriented Participatory Research (COPR) were included. Both of these approaches in particular were attempted to appreciate farmers' indigenous technical knowledge starting from the very beginning of technology development through the technology transfer processes.

The earlier approach in Ethiopian research system was development of technologies without adequate knowledge of the farming system and farmers' circumstance for which the technology is attempted. The distinctive role of various social groups, and responsibility of the farmers were hardly assessed. In contrast, recent studies realized that the knowledge and understanding of the farming systems and farmers profiles as well as role of various social groups were quite essential before embanking any development interventions. The prior assumption was that farming systems and farmers' community were perceived

to be homogenous; but in reality farmers within a community and household as well as the farming systems expressed heterogeneity and complex life styles. The role and responsibility of members in the household referred to be gender groups. This gender groups seems to be variable and complex that has hardly be treated by research as distinctive area of research.

In the history of human kind, gender inequality exhibit across many dimensions of life worldwide. The nature and extent of gender discrimination varies considerably across countries and regions, as does the pace of the progress. In no region of the developing world do women experience equality with men in legal, social and economic rights. Gender gaps remain widespread in access to and control over resources, in participation in household economic development, on power and political voice. While women and girls bear the largest and most direct costs of these inequalities, gender disparities detrimentally affect the welfare of every one in one society. Gender inequalities have been shown to reduce economic growth, which in turn has an effect on the well being of the whole society (Klasen, 1999).

The case in Ethiopia is not different of the reality where by adoption rates of agricultural technologies usually remain low. It happens due to inadequate knowledge of the farmers' circumstances for which the technologies have been developed and lack or poor participation of the productive groups of the society in technology development. On contrary, the glimpse of current increase in production is resulted of good community participation

and concerns of addressing gender issue in research. The focus on gender was attempted to ensure equal participation of men and women in project designing, planning and implementation, which none existed. In this line it is the question of the day to point out the real area of focus for intervention to change the existing scenario of poor agricultural production and poverty as the problems are deep rooted and so perplex bounded by social, economical, political and policy frames.

According to Yeshe (2000), understanding gender roles and responsibilities in agricultural production and decision-making has substantial role in making agricultural research and development more comprehensive, demand oriented and complete. The roles that male and female play in the entire process of production, and the responsibilities bestowed up on each coupled with the rights to benefits derived from improved technologies need to be properly understood if the results of agricultural research has to be effectively and efficiently utilized.

Preliminary research report by Tadelech (2000) indicated that women farmers provide more than half (50-80%) of the total labour and time inputs required for crop production, and cover up to 77% of the labour and time inputs required in livestock production. Female farmers are also involved in generating additional income for their families, besides the considerable household chores they were performing. The challenge is, thus, not to integrate women into the new development process, but to recognize that they are already principal contributors to the traditional economy and,

through that recognition, elaborated concrete actions to increase their productivity and standard of living.

At this point in time, as there are differential roles and responsibilities as well divergence in degree of access to and control over resources by various gender groups, this also reflects on the benefits within the household and community members. Hence, generation of gender mainstreamed information with respect to agriculture and related activities are imperative to make benefits out of the best roles of gender groups in development. This gives rise to targeted (focused) technology generation and transfer.

1.2 Statement of the Problem

Population increase and land fragmentation are extended constraints in Ethiopian agricultural. Overstocking and communal right to grazing land are another area, which poses serious problem for poor livestock productivity. The other aggravating problem is deforestation as a result of the high fuel wood demand. The overwhelming population increase coupled with extended farming and over grazing add pressure on the productivity of the land. The consequence also results in loss of various tree species and hence is desertification. These things have many related causes. Ill-defined property rights and insecure tenure rights perhaps, contributed much to land management and reduced investment on soil fertility enhancement.

Land degradation and environmental dilution entailed food insecurity and hence, is poverty. The lack of appropriate agricultural and land use policy also aggravates the problems mentioned above.

The pioneer victims of such problems are women, children and elderly citizens. The strategic way out in such cases is to design use of cost effective technologies and improved seeds of various crops. The homestead crops for which women take maximum responsibility (like potatoes, and other vegetable crops) helps in attaining household food security and hence increases household income. Yet, lack of improved varieties of such beneficial crops remained to be challenges to the study community in particular and the nation at large.

Besides, information on knowledge of improved production practices especially for horticultural crops and the role of gender groups in this regard is scant. Albeit the significance of this sector *vis a vis* the role of women much effort has hardly been made to integrate improved horticultural development into household food security attaining components. Lack of information about specific gender roles is the most important constraints to increasing crop productivity in Ethiopia, especially of horticultural crops like potato. On top of this, lack of adequate knowledge on improved agronomic practices and related natural resources management is the most pressing constraint specifically on root crops like potato.

With this perspective, farmer based participatory on-farm seed multiplication, dissemination and adoption of improved potato production technological packages³ were initiated and implemented in the western parts of Ethiopia with the financial assistance of ASARECA/CIP. This is because seed is a fundamental input in crop production and it was observed to be most significant constraint in potato production. Indeed, there can never be food security without securing quality seeds. Use of appropriate soil fertility management practices is also a component for realizing increased production on sustainable base. Nonetheless, the notion of gender issue and social analysis has not been addressed so far in the project due to limited resource. The sustainability of such participatory approach in no doubt depends on determination of specific role of the gender groups and empowerment of the groups in their area of responsibility where they can show maximum contribution. This project was, therefore, designed to integrate gender role analysis into the potato project in operation.

1.3 Purpose of the Study

The study areas (Jimma Arjo, Cheliya, Horro, Jimma Rare and Jeldu districts) have been the most potential potato producing districts of Oromia National Regional State. It was reported that more than 95 % of farmers in these areas depend, above all, on the food that comes from potato during the hunger months⁴ that is

³ Technological package-includes improved seeds, storage mechanisms and resource management.

⁴ Hunger months-are usually classified as the months of June through September.

why potato is considered as a transitional crop that help to escape seasonal hunger. In Ethiopia, it is a norm that women and young girls play substantial role with respect to the production, processing, marketing and utilization of potato. On top of this, commendable activities of soil fertility management and water conservation practices are performed by these groups. This doesn't mean that other social groups are exempted from other agricultural practices. They involve in various practices in varying degree.

In spite of such intensive efforts at household level, documents are scant (if any) that reveals the distinctive role of women in agriculture and potato production as a whole and no information has been recorded for their participation in potato seed technology dissemination with regard to the varying roles of different gender groups. Therefore, the premises behind this study were to examine and analyze gender roles and responsibilities; to identify the social and economic factors that influence potato seed production technology promotion and the natural resource management in the selected districts. Very specifically, the study was targeted to address the following questions.

1. What key problems exist for low productivity in potato farming with in the farm households?
2. Whether there is any soil fertility degradation and water conservation problem in the potato farms; and what local strategies farmers been using to solve the problems.
3. If there are there any significant differences among the potential potato producing districts in terms of behavior of technology

adoption, infrastructure facilities, production yield and area coverage, economic value and utility? (if any) why the differences occurred?

4. What gender differences/inequalities exist in local communities who were involved in potato production and related natural resource management?
5. How are the roles of different gender and other social groups affect potato technology uptake and potato production; besides it addresses if there is gender influence on soil fertility management and resource conservation.

Hypothesis

Research assumptions that guided the investigation include:

1. Access to and control over resource affects the role of gender in potato production and related natural resource management practices.
2. Women have more contribution in potato production and its complimentary activities than men.
3. Age and education level influence adoption of recommended potato production technologies and input use.
4. Wealth and family size have positive correlation with adoption of potato production technologies and related natural resource management practice.

1.4 Significance of the study

This study has pragmatic advantage in generating basic knowledge and information about the role of gender and social analysis pertinent to potato production technologies in particular and agricultural technology adoption in general in the selected sites. This has been realistic on the bases of lack of adequate literature on the role of gender and social groups analysis in Ethiopian agriculture. The out put of this study, therefore, narrows the existing knowledge gap on the role of different gender groups in agricultural production. The practical result of the study may be used for re/designing the planning approaches in a way that bears the greatest contribution of specific gender groups in development. This entails the development of appropriate gender based policy for agricultural and horticultural development. It can also be used as a ground base to promote gender sensitive research and development strategies. Strategic planning that promotes the role of gender groups would benefit more from this result. This, on one hand, encourages the participation of women in development program planning processes and on the other hand it hasten the family based development initiatives of government in which women had primary role.

The study is specifically an opportunity in generating gender profiles, resource bases for women and men. It further analyzes factors that influence the role of women in particular, their access to and control over resources. Specific to potato production practices, this study gives information that necessitates promotion

of women best practices on the matter and give a way for further investigation. It also gives the community the chance of understanding their situation and role advantages in the production system.

2. CONCEPTUAL FRAMEWORK

2.1 Gender and Sex

Gender refers to the relations between sexes, produced by social construction. It is a biological fact that women can give birth or nurse a baby; it is a social construction that child rearing should be left mainly to women.

Gender relations and identities are not universal, but vary from culture to culture, and some times from community to community. It is quite dynamic to define in common sense. But literally, gender refers to the socially constructed roles of women, men, girls and boys. Everywhere in the world, the roles of women and men are different from each other, but that depends on situations of the country. Tasks that are intimately related with men in one place are the tasks of women in the other. It is also important to understand that variations take place from one country to another, as well as with in a country from one region or cultural group to another (OSSREA 2003).

Flintan (2003) reported that women have less access to education and health care and fewer economic opportunities. The author further pointed that women are less mobile and tend to be most active around the household. Though it is usual for women to be responsible for household matters, they still do not tend to have decision-making power on resources especially, land and capital. In Africa in particular, societies confer only secondary, usufruct

rights to women. Women are normally entitled to cultivate land controlled by their husband's lineage but not to alienate or inherit it. In contrast men had full access to and control over such resources and can make any sort of decision regarding the resources.

Generally speaking, women's role in decision-making on household resources at both macro and micro levels remains low; it is dominated by men. Most experiences in Africa indicate that these issues are rarely addressed. Many other factors are contributing to this fact. Among them are; low self-image and lack of confidence amongst women themselves.

Specific to Ethiopia, the deep-rooted social norms and cultural barriers tended the women to have marginal role in most decision-making. Hence, this study is intended to produce findings on the major role of women and other gender groups in agriculture in general and in potato production in particular, and promote the specific duties in which each of the groups show better contribution and relative advantage for improved productivity.

2.2 Gender Analysis

Gender analysis is an organized approach to understand how men and women, male and female household members, relate to each other in terms of roles and responsibilities, access and control of resources and benefits. This is the process of systematically documenting and understanding the roles of men and women,

boys and girls in the content of data. Gender analysis means looking at communities in terms of the situation of boys, girls, women and men. It is systematically organized approach to understand and plan in a way that enables addressing gender issues in projects and programs.

Gender analysis seeks to extract and organize information pertaining to the differences between men and women in the allocation of their labour to production and routine domestic tasks and the difference in the distribution of resources and assets to which they have access or which they control.

Gender analysis is a tool to better understand the realities of the women, men, girls and boys whose lives are impacted by planned development. "Gender" as an approach to development implies social struggle in that the reduction of disparities between the sexes constitutes its keystone. Gender is also a tool of analysis and evaluation as to the extent to which rights are enjoyed and exercised. It leads to examination of participation in decision-making of access to and the control of resources, of equal opportunity, and of equity between men and women.

3. LITERATURE REVIEW

3.1 Gender and Household in African Agriculture

Some aspects of African women agricultural work such as harvesting and food processing are better recognized and accounted for than other aspects, such as women's work in land preparation, planting, and weeding. An early assumption of the several division of labour in African Agriculture was that men cleared the land and women planted, weeded, and harvested. That is men and women were described as each being responsible for certain discrete tasks. However, careful studies show that a variety of labour and cultivation pattern exist (Spring 1994; Weidemann 1987). Various researchers argue that smallholder agriculture in Africa and elsewhere being more feminized as women carry out more work, because men are doing part time farming entirely, do to local employment, out-migration war and drought (Rogers 1980; Spring 1994). Sex ratios of working-age people in rural areas of many countries show that there are more women than men and that the numbers and proportions of female-headed households are increasing (Spring 1994).

Technology transfer is frequently hindered when the different actors involved in actually doing the agricultural work at the household level are not taken in to account and technologies that are developed may be ill-suited in terms of personnel, capital, land and equipment (Regers 1980; Poats *et al* 1988). A consideration of intra-household labour allocation and decision making practice show that in many places, female family members will have to

provide the labour and either make or be involved in the decision as to whether or not to adapt the technology (Feldstien and Poats 1989). This is because labour, access to resources and remuneration are not consolidated in one neat family unit, but often are dispersed among household members.

A failure to look at who does what farm operation so who makes which decisions, and who receives the remuneration and makes further investments will affect how successfully any innovative technology can be adapted. Some authors noted that the introduction of high yielding varieties or more intensive cultivation or processing methods require more labour in managing, harvesting, processing and storing crops; this extra work often falls on women (Ferguson and Horn 1985; Feldstein and Poats 1989)

3.2 Gender Based Labour Division of Ethiopian Agriculture

In Ethiopia, the sexual division of labour varies by farming system, across cultural settings and location, based on different wealth prestige. Dessalegne (1991) noted that peasant women in Wello have great decision-making inputs than women in Wolayita in term of cultivation, land use, and cropping plans, every decision is taken by male. In Wello, men plough and sow, and women do other aspects of cultivation. Dessalegn also argued that in Wolayita, women do little other than caring animal manure (although female household head perform many agricultural tasks). They also are heavily involved in grain marketing, sells of horticultural crops and

animal products. Yet the power in deciding on the income generated remain none or minimal.

Contrasting *enset* with *tef* and maize production in northwest Wolayita in terms of gender differences in labour and decision-making, Sandford and Kassa (1993) reported that those who do the work make decisions. Women do much of the labour on *enset* processing and make decisions on varieties and distribution. They do little in the planting and harvesting of *tef*, in which men do take great part. Therefore, men control the sales and distribution of this commodity. However, women process the *tef* consumed at home, and women may sell any surplus 'injera'⁵. Men dominate the on production works and sales of major cereals like maize, although all household members some stakes in the production process. The authors also indicated that location of the fields influences women's labour contribution and subsequent control on the assets. *Enset* gardens are close to the house and maize fields are often nearby, but *tef* fields are more distant. Hence, the role of women increases with increased proximity of the production fields to home.

In some areas such as Zenga Awande, women do not participate in crop operations. It is a shame for a husband or a father to let his wife or daughter work on crop cultivation fields. Farmers were astonished when they saw for the first time women weeding with men using hand hoes" (FARM Africa 1992b). In Kindo Koysha, areas of Wolayita, women's usually work on cultivating vegetable

⁵ Injera-Ethiopian local bread

garden, decorticating enset, and extracting fibers (FARM Africa 1992a). Women also make and sell butter, cheese, 'injera', 'borede', a weak beer, and 'arake', distilled sprits. Women are involved in petty trading of goods bought in one market and sold in another. In terms of decision-making, they decide on vegetable productions. On the other hand, male household heads decide on main farm activities. Women are responsible for their children's comfort and satisfaction (FARM Africa 1992b).

4. METHODOLOGY

4.1. Description of the Project Area

This study was carried out in two zones of Oromia Regional National State during 2004 and 2005 by the financial assistance of OSSREA⁶. The project area includes two districts of West Shewa Zone (Cheliya and Jeldu) and three districts of East Wellega Zone (Jimma Horro, Jimma Arjo and Jimma Rare (Figures 1 and 2). These districts are the major potato producing districts in the zones based on secondary data and pervious field experiences. This is because potato usually performs better in temperate type climate of the highland areas of Ethiopia due to its good climatic factors and soil types. Because of its potential, potato production promotions have also been done through farmer based seed increase and dissemination of technologies.

The topographical features of the study area represent wide elevations that enable the districts to have three agro-ecological zones namely *Dega* (highland), *Woina-dega* (mid altitude) and *Kolla* (lowland). The proportion of the area with in the three agro ecological category is revealed as under. All districts receive unimodal type of rainfall. Agriculture (crop production and the raring of livestock) is the major activities of the districts.

⁶ OSSREA- Organization for Social Science Research in Eastern and Southern Africa

Table 1. The proportion of land areas based on traditional agro-ecological classification

District	Agro-ecologies (ha)			Total
	Lowland	Mid altitude	High land	
Cheliya	21,237.7	41,716.9	12,894.3	75,894.3
Horro	1,258.8	48,341.4	32,046.7	82,646.9
Jeldu	27,180.7	44,186.0	68,021.3	139,388.0
Jimma Arjo	22,017.9	44,795	9,110.8	75,923.7
Jimma Rare	6,134.0	17,720.6	10,223.4	34,078.0

2.1.1. West Shewa Zone

It is one of the most productive zones in Oromia. The zone comprises different agro-ecological and climates which suit for different horticultural crops production zone, Cheliya and Jeldu districts have been selected for this project based on their potential and large coverage of potato production (Fig 1). Cheliya has wider agro-ecologies suitable for potato culture. Based on secondary data, about 50% of the arable land of Jeldu district is suitable for rain fed potato production (Table 1). Due to this fact and hence, currently thanks to passionate commitment of Holetta Agricultural Research Center staff and active farmers' involvement in potato seed production, Jeldu district is becoming the center of extensively dependable clean potato seed production area in the country.

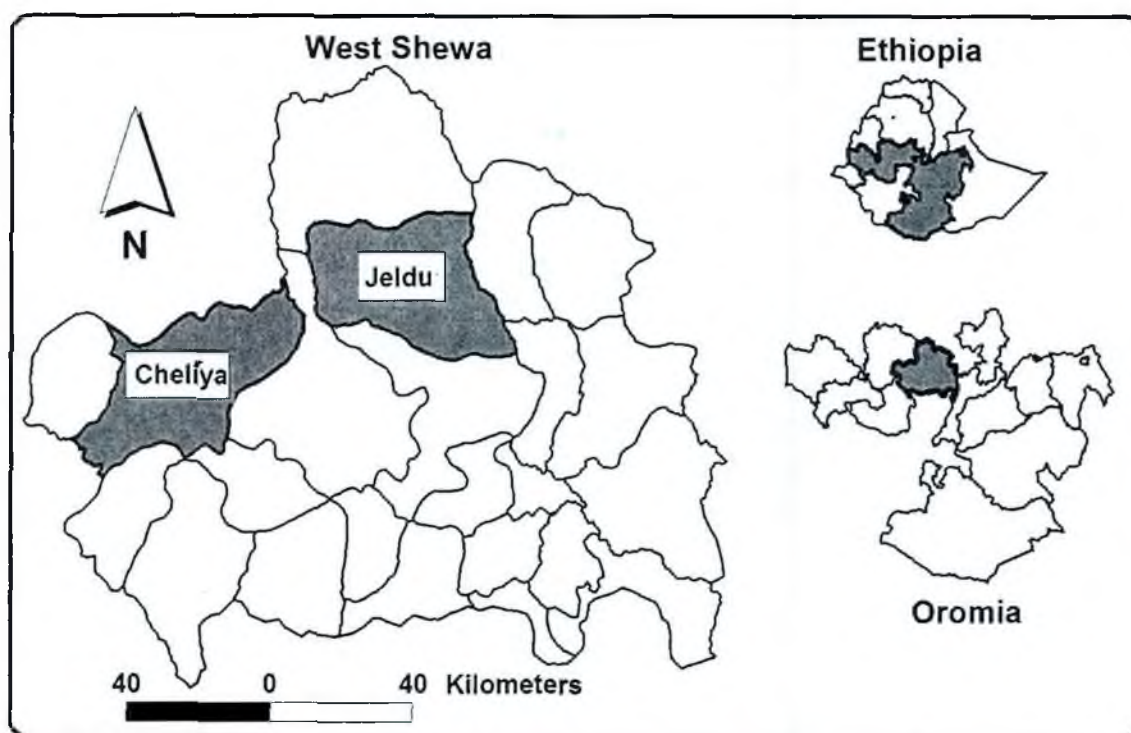


Figure 1. Study districts in West Shewa Zone of Oromia, Ethiopia.

2.1.2. East Wellega Zone

East Wellega is also another highly productive zone in the region. This zone comprises 17 districts and most of the districts are food self-sufficient. The zone has three most potential potato producing districts, Jimma Arjo, Jimma Horro and Jimma Rare, here described as the project sites (Fig 2). In these districts, there has been potato production promotion activities through farmer based improved potato seed production and dissemination. The project

has been under implementation since 1999 by the financial assistance of ASARECA⁷/CIP⁸.

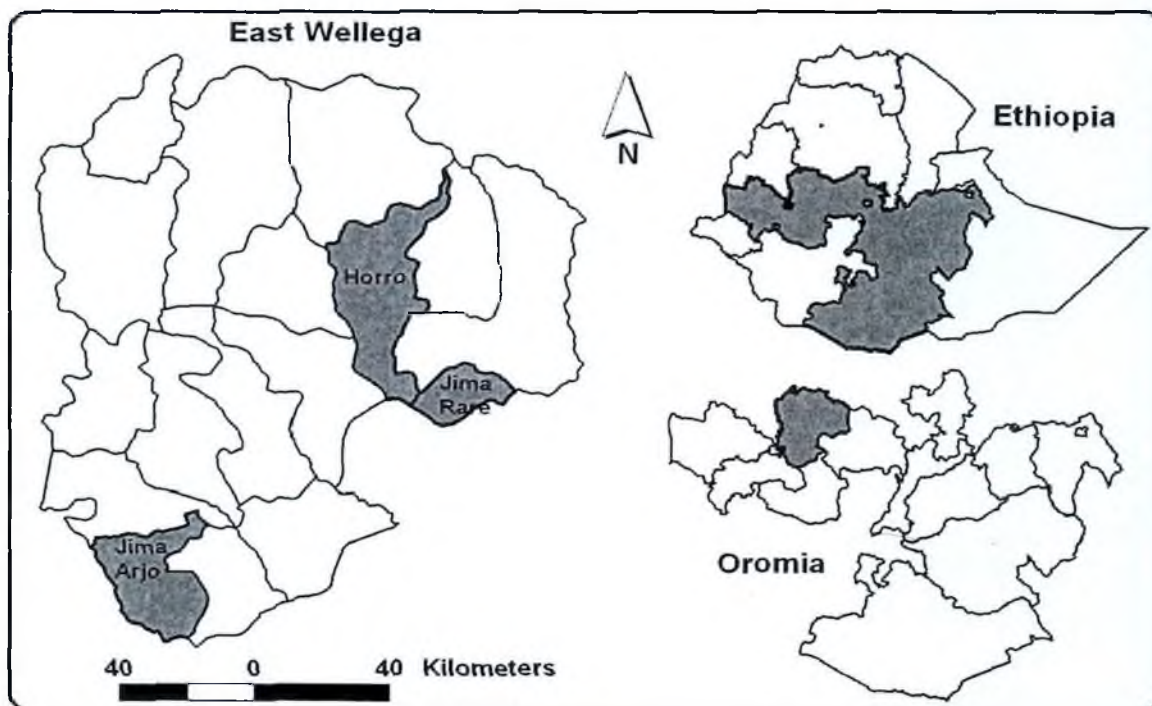


Figure 2. Study districts in East Wellega Zone of Oromia, Ethiopia.

4.2 Methods of Integrating Gender Issue into the Ongoing Project

Prior communication and orientation has been given to concerned government offices especially of the MoARD. The objectives and purpose of the study has been well discussed with the concerned bodies and all contacted had good understanding of it. The same was done in time of group discussions and household survey. After

⁷ Association for Strengthening Agricultural Research in Eastern and central Africa

⁸ International Potato Center

thorough discussion, the MoARD office felt that the office is in dearth of information on the role of women in development as a result of which they expressed high degree of importance of the current survey. In this regard, experts and groups of relevant skill were assigned to collaborate with the survey team through out the data collection process. Though the ongoing project is promising and to the effect of intended objectives, the role of various gender groups in the success of the project was not well identified. This is the reason for the intention of integrating such a study to the ongoing project. This result, in no doubt, contributes to understanding of the potentials, opportunities and threats in participating the gender groups in appropriate line of development. It also encourages development practitioners to design gender-mainstreamed projects.

With understanding of the purpose of the project and assignment of experts, community members and local administrators were given sufficient awareness on the objectives of the study. This created good atmosphere for working with farmers. Following the preliminary duties for the study, individual host⁹ farmers were contacted for information gathering. Non-host¹⁰ community members were also contacted to confirm the reliability of the information.

⁹ Host farmers-farmers who were in the project beneficiary group (potato farmers)

¹⁰ Non-host-farmers who were not direct participant of the project

4.3. Methods of Data Collection

Before the commencement of data collection, gender analysis methodology training was offered the team entitled to carry out the job. The team includes researchers and technical assistants from the research center. The team was made in such a way to realize good gender composition. This was to encourage female interviewers express their ideas and experiences freely.

With the development of well-defined survey team various sources of information were envisage. Secondary data were collected from relevant offices in the study area; whereas primary data were generated by use of different social study methodologies. These include, participatory rural appraisal (PRA), focus group discussions, key informant interview, gender based activity profile, decision making roles analysis, wealth ranking and household survey. The information collected were refined to realize the complimentary and reliability of primary and secondary data.

Non-structured and structured questionnaires were developed and used for key informant/ group discussion and for formal household survey respectively. Primary data were collected by purposive sampling from potato producer from three PA of Cheliya, six PA of Horro, two PA of Jeldu, six PA of Jimma Arjo and three PA of Jimma Rare districts.

In order to generate socio-economic information, 275 sample households were interviewed. The interview maintained the proportional balance of men and women headed households. The

sample was from the three potato production promotion project districts of East Wellega Zone. Key informant interview was done for all selected districts in the zones. Assessment of the role of gender groups in agricultural production, access and control over resources and resource use efficiencies were key areas of investigation. In this regard, group discussion, activity profile analysis and wealth ranking were conducted in different villages of the districts. Purposively selected male and female farmers of different age, education status, marital condition and social status were included during the interview and discussions. In the process, male and female group discussions were facilitated with their respective gender groups to avoid cultural barrier and female shyness of speaking in masses. This strategy gave them free environment to express themselves.

4.4. Data Analysis

The primary data collected were analyzed by simple descriptive statistics using the Statistical Packages for Social Sciences (SPSS). Associations and correlations have also been done as deemed necessary.

5. ANALYSIS OF FACTORS AFFECTING GENDER ROLES AND RESPONSIBILITIES

Through several group discussions across the study areas, it was recognized that gender roles and responsibilities are highly influenced by the education level, age and sex of the household head, religion, ethnicity and wealth status (livestock and land ownership, etc). Description of each is briefly made as under.

5.1 Headship, Ethnicity and Gender Equity

Often people are classified on the basis of various criteria, i.e., gender, religion, ethnicity, social backgrounds, physical conditions, education, age and marital status. These social, economical and cultural backgrounds make groups of people in a community or a nation different.

Current demographic information on household leadership indicated that the proportion of MHHs in the surveyed districts are 80.4%, 89.5%, 67.0%, 89.9% and 86.6%, respectively for Cheliya, Horro, Jeldu, Jimma Arjo and Jimma Rare. Of all the districts, Jeldu district revealed larger population of female-headed household (33.0%). This might be attributed to the high rate of male migration due to over population coupled with landlessness. Consequently, the household leadership was observed to influence the traditional gender roles. This is to mean that women of Jeldu who are house heads do all the roles that other wise would have been done by male under normal condition. Thus, they operate all

farming activities apart from their usual contribution to the farm activities.

On the other hand, it was realized that as age of the two sex groups approach to youth (be younger) the gender equity and understanding of their rights is correspondent. i.e. there is an indication of equal labour share, access to resources and control over the same; they also exercise correspondent decision makings power in the household.

Ethnicity as other influencing factor implies that most of them practice a day old traditional way of sharing roles and responsibilities. As far as demographics is concerned, Oromo ethnic group accounts 95% for Cheliya, 95% for Horro, 99.99% for Jeldu, 95% for Jimma Arjo and 98.8% for Jimma Rare. This implies very few other ethnic groups inhabited in the study areas other than the native ones (i.e. Oromo). Alike many other reports, the current study identified ethnical variations in gender discrimination. This was evidenced by the women key informants at Horro expressing their idea in proverb as "*Oromoo biratti dubartii fi foon rakasa*". This means that "meat and women are cheap" under Oromo culture. They further reported that in earlier days it had been difficult for a woman to communicate with men due to high degree of gender discrimination. Most women live in isolated and secluded not to participate in most official and social gatherings. If they could participate, they would remain non-voting member.

Table 2. The proportion of male and female population of the study districts

District	Types of population					
	Male	Female	Total	MHHS	FHHs	Total
Cheliya	70,935	64,768	135,703	19,209	4,554	23,763
Horro	57,110	52,003	109,113	11,135	1,310	12,445
Jeldu	94,357	98,209	192,566	24,590	12,132	36,722
Arjo	50361	36641	87002	11,803	1,296	13099
Rare	31,452	32,175	63,627	6,596	1,024	7,620

Source: Cheliya District Ministry of Agriculture and Rural Development (MoARD), 2003; Horro district MoARD, 2004; Jeldu District MoARD, 2003; Jimma Arjo District MoARD, 2004 and Jimma Rare District MoARD, 2004.

Table 3. The proportion of male and female population of Jimma Arjo district

Type of population	Male	Female	MHHs	FHHs
Residents	48,859	35,553	11,033	1,236
Settlements ¹¹	1,502	1,088	770	60
Total	50361	36,641	11,803	1,296

Source: Jimma Arjo District MoARD, 2004.

5. 2 Religion and Gender Equity

The influence of religion on gender equity is not directly related to the findings and investigation of this study. However, it was found that the various religion groups determine the role of women and men in agricultural production and household duties. This discussion was brought up to relate the fact that the rights of women and men determined by religion has part to influence and/or limit the role of both gender groups.

¹¹ Settlements indicate peoples who come to make their home and settle in the district.

In the study districts, though population and type of religion differ, districts are categorized to various religious groups, viz, Muslim, Orthodox Christianity, Protestant Christianity, and "Waaqeffannaa"¹² (Table 4). Besides the mentioned ones, Catholic is found operating in Cheliya and Jimma Arjo districts. The average proportion of the religious groups over the selected districts indicate 60% for Orthodox 25% for Protestant, 10% for Muslim, 4% for Catholic and 1% for Waaqeffannaa religions. This implies that Waaqeffannaa is a religion under great threat. This may be due to the influences of the foreign religions mentioned above. In contrary, the Oromo religion Waaqeffannaa is under great revival as noted by the 'Irecha' annual celebration, which is getting heightened attention by Oromo peoples from different corners of Oromia and other worlds.

According to the respondents, there are two major religions known in the community of Jeldu, namely, Orthodox Christianity accounting for 65% and Protestant for 35%. It is important to note that, Orthodox religion followers are multi-religious in that they attend both Waaqeffannaa and Orthodox in Jeldu and across the project districts. To justify this the Jeldu Oromo farmers indicated (Nama amantaa Ortodooksii Qofa Hordofu Gondorii fi Goojjam Keessattuu argattuuree?), that means the one who only follows Orthodox Christianity may not be even exist in Gonder and Gojam. The Protestant and Catholic religions somehow manifest better

¹² Waaqeffannaa is an inherited Oromo religion that is a belief in one God commonly called *Waaqa*.

opportunity of gender equity and equality than the traditional Orthodox religion.

Table 4. Major religion operating in the districts

District	Type of religion				
	Catholic	Muslim	Orthodox	Protestant	Waaqeffannaa
Cheliya	X	X	X	X	X
Horro	-	X	X	X	X
Jeldu	-	-	X	X	X
Arjo	X	X	X	X	X
Rare	-	X	X	X	X

Key: Arjo represent Jimma Arjo district and Rare represent Jimma Rare district.

In this context, equality refers to the condition of enjoying substantial similar rights, privileges and protection. Citizens' equal protection in view of the law however does not necessarily result in socio-economic equality. Despite the fact that law guarantee equal right to citizens, but still inequality is observed among individual and groups. The few number of school attending girls than boys is exemplary for this concept. This implies that gender discrimination also occurs by religion, tradition, ethnicity and culture.

Participants noted that protestant religion has many merits; usually teaches and advises children to honor their family and obey commandments. They further pointed out that it protects peoples from immoral acts such as harlot, adultery, prostitution, theft, lying and criminal acts. It also favors faithfulness and love to one another and advocates accountability and responsibilities of individuals to their household, community, region and nation at large. Consequently, most of the followers of this religion become

humble, obedient, submissive to their family, and loyal to their nation. In the context of this doctrine, all people in the groups irrespective of sex had equal rights on resources, yet the role of the groups still differs due to tradition.

According to the key informants of the group discussion, some religions prohibit men to work on certain holidays. For example in Horro and Jimma Rare district "Waaqeffannaa" religion prohibit men to work on the holyday called "Garanfasa" that may have favored them to enjoy, while women work extra duties and accomplish many responsibilities. Invariably over the districts, Orthodox Christianity followers do not farm on certain holydays like "Mikaa'el"(12th day of a month), "Maramii" (21st day of a month), "Gorgisii" (23rd day of a month), "Balagzerii"(29th day of a month) and also on many others. Not only the followers of the religion, but also non-followers in the community never be allowed working on the days mentioned; if one dares to do it is considered that curse will come up on the community. As a consequence of this disobedience, tragedies such as hailstorm, strong weed, lightening or flooding would happen.

In Orthodox Christianity females usually considered second to male and they are merely supporters and servant of men. From the group discussions it has been further reported that in Orthodox Christianity, if a woman commits sexual intercourse even with her husband and under menstrual cycle, she is not allowed to go to the church. In the same cases mentioned above, under Waaqeffannaa religion also female are prohibited from participation

in any religion ceremony or worshiping activities. This vividly shows us that religion as institute imposes gender discrimination and inequality.

Of course, in Waaqeffannaa religion it could be the male or female who could be the holder of the sprit with the knowledge of "Waaqa" or the provision of sprit by "Waaqa". One could claim that how Waaqeffannaa and Orthodox Christianity deny equity and equality between men and women. But it could be possible to argue that the Protestant religions have certain substances of modernity in that they provide formal and informal trainings about denomination of their doctrine, ethical acts and social norms and behaving in the society based on the modern world education and biblical commandments. It is influential that the education given by these religions is aimed at providing timely out look or to help the populations break the cycle of dependence and create spiritual, physical and material well-being. In this regard they could have contributed much in conveying to the communities timely and modern world information and technologies. Therefore, if the government properly handles and utilize them, these institutions could be the real instrument that might serve as liaison for social change.

On the other hand, it was noted that there was no clear association between type of sex and religions. However, age apparently correlated with religion type. The elderly people whether male or female tend to belief Waaqeffannaa or Orthodox Christianity, while large proportion of girls and boys tend to follow

protestant religions, irrespective of their families' religion. Through different discussions that were made across the study districts it was concluded that religion poses differential influences on different gender groups.

5. 3 Education and Gender Equity

This part deals with the education status of the rural communities of the study districts related to gender. It hardly possible to obtains reliable document on the education status of the rural communities of the districts. However, in Jimma Arjo rough estimates were made as follows: 60 % of the farm households are educated but less than fourth grade, while 20 % of the farm households are fourth to eighth grade and the rest 20 % are non-educated.

Groups of people over all districts unanimously reported that there has been wide literacy gap between female and male, pointing out that male better educated than female due to deep-seated traditional influences. Some of the reasons are the communities culturally accepted this local saying "Dubarrii manaa baate jennan warraa baate jedhani" as truth. This local saying simply means, "Once female go out, they will not come back". So it implies do not send girls to school. This culture undermines women and supposes that they cannot bring change after education. As a result it was culturally taboo to send girls to school. They assume that if girls go to school they would be exposed to different social crimes like rapping and sexual abuse. Similarly, different authors

revealed the long-standing problems associated with the Ethiopian education system, which lacks essentially quality and relevance and gender inequality to access. Thus, the number of schools and the ratio of students to the general population were infinitesimal. Moreover, as most of these schools were located in the main towns and cities, the huge rural population particular females who are domestic dwellers did not benefit from education system.

Hence, deeply entrenched illiteracy makes it hard for human to know their rights and enjoy them. It also makes it hard for them to acquire skill and employment that help improve their lives. Fortunately, however, currently the gap of literacy seems somehow narrowed due to the improvement infrastructure and awareness about the merits of female education in rural community. If the present progress become sustainable and more efforts rendered, it is hoped that there would be tradeoff in literacy between male and female in the fourth coming decades.

Since education has enormous merits for the societal development, it directly improves productivity rate of return for people. In addition to this, education has wide range of indirect effects, which instigate positive changes in people's attitudes toward work and society. It makes easier for people to learn new skills throughout their lives, and hence facilitate their participation in modern economics and societies. It is also an important factor, which affects the healthy and life expectancy of individuals, because it equips them with the knowledge and means to prevent, control and detect diseases as Tadele (2002) reported. In overall, in educated

households there was noticed that there is better gender equity because of better understanding of basic human rights.

5. 4 Family Size, Health and Gender Equity

The need to survive individually and as a species affects human fertility decisions. But there need to be some sort of limit of human fertility. It also determines people's interactions with their environment, because they drive their livelihood and ensure their survival from the natural resources available and accessible to them.

Invariably all over the study districts, useful findings reported that farm household communities have more family size, and this is resulted from limited access to education, traditional consideration of children as asset, fear of death due to various diseases. On the other hand, still due to limited knowledge of birth control, malnutrition, poor health care, poor clothing and sanitation, there were high child mortality and morbidity in illiterate family than the literate ones. As shown in figure 3 below the larger the population size or family size the poor the social service access, food insecurity, poor health care, high child and maternal mortality, arable land scarcity, poor economic development, etc., and complex repercussion.

In rural farm household of the study districts, there is poor health condition resulted from poor education, poor sanitation, poor clean water, malnutrition and poor health service. In the majority of

cases, pregnant women, children and elderly groups suffer much more health problems in rural communities. In general, health service forms part of the basic social needs of the society. Health is a factor in the development endeavor as a country's feature ultimately depends on the well being of its population for the realization of human potential. Improved health also contributes directly to welfare, by reducing sickness and mortality and by increasing life expectancy, indirectly by improving labour productivity. Good health directly contributes to economic growth while poor health drives poverty, hence poor health and poverty become mutually reinforcing. As common to the whole Ethiopia health status, is among the least in the world (Samson and Tadele, 2002) the study communities were also experience poor health condition.

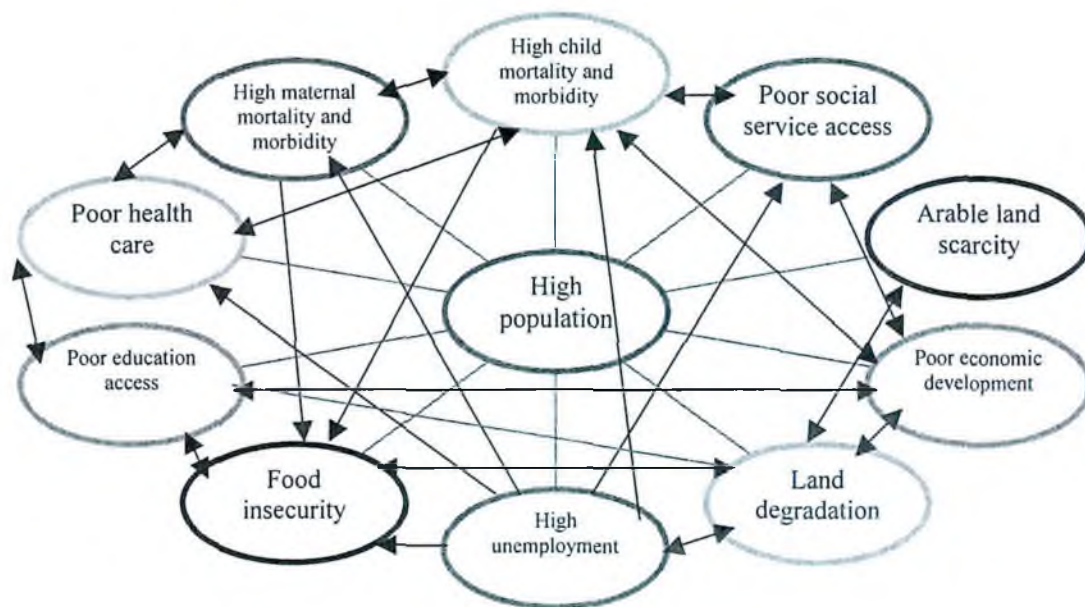


Figure 3. Depicts population increase and interrelated social problems.

According to key informants and group discussion reports across the districts farm households have, larger family size, and high child and maternal mortality rates. This is perhaps because of they give birth without family planning. It was noted that the families say "let them born and grow as to their chance, as to God's will". The other reason is that it is believed in the society, "God gives children", therefore, they don't want to stop giving birth. They also say don't interfere with God's duty; He gives us the amount He desired and we care for our children. The other idea is, of the many children born no body knows who will be successful in his/her future career and help his/her family. They also presume that once born, they can survive working any type of activities based on their age in their local community. The rural farm households also want to have many children as an opportunity to

overcome risk of child death. In overall, in the rural farm households children supposed to be an asset and stronghold to their families. On the other hand, the larger the family size, the lesser the care given to the children. At the same time other related problems such as diseases, lack of access to education, poor clothing, malnutrition and poverty are also quite high.

Usually, most educated men of Jimma Arjo district engage in polygamous marriage mainly with girls, large land owner widows, and strong and young females seeking human labour and resources to become prosperous, which has also positive relationship with increase of family size. Farmers recognized the problem of large family size. Chiefly women key informants of Jimma Arjo reported that "large family size is by itself is a sickness unless there is corresponding wealth for the family". On the other hand, few, even though they are willing to take advice of birth control and family planning, they afraid of health problem related with taking birth control pills and as a result they prefer to give birth. Moreover, it was indicated that interruption in using of pills also leads to untimely or unwanted pregnancy, which in turn contributes to larger family size. The negative side effects observed by the local people, such as gastric problems and inadequacy of pills for use in health centers are the reasons raised for the interruption of use of pills and family planning.

Higher child survival rates resulted from good health care and better nutrition reduce the need to replace children who have died or to have more children to ensure against the livelihood of the

future deaths. Therefore, in this regard absolutely much extension service is required to effectively convince and at least change the attitude of the illiterate rural farm households. Or it is conceivably important to provide options of birth control measures that may suit their interest.

In principle, there is no gender related differences to health service access, hence both men and women have legally equal right. On top of that there is no statistical data that indicates us the gender related health differences in the society. However, it is vividly observed that women more vulnerable to health problems because of their natural biological characteristics such as conceiving, giving childbirth and breast-feeding. In addition, because of men usually have dominion of power on resources use and cash access, women might not have equal health services access as men. This can be further argued that when women get sick, it is men who decide the timely deliverance and medication of them as long as women do not have the control over of resources including cash in a household. During group discussion, we noted that women's consciousness of their being lack of power and control over resources and benefit use in the household in particular and in the communities in general were raised.

5. 5 Migration

Obviously, the young segment of the population especially boys and recently married men migrate because of land shortage. Married men temporarily migrate to seek off-farm jobs during off-

season. Partly girls and more dominantly boys permanently migrate after they complete their secondary education in search of job, as there is no official employment in rural areas.

In Jimma Arjo, largely married or non-married either educated or non-educated male temporarily migrate to the low lands of the surrounding zones or districts to be casual laborer for production and harvesting of coffee and other crops. These temporarily migrants are overwhelmingly landless and poor farm households. Another temporarily migrants are students, young boys during summer vacation to collect money and resources for schooling. On the other hand, in rare cases young females permanently migrate to towns to work as prostitutes because of household poverty and some times to seek for modernity and urbanization. In overall, migration is basically considered as mechanism of relief from temporal food shortage of the household and or from permanent landlessness and resultant poverty of the rural population. This study substantiated the various authors' argument that smallholder agriculture in Africa is becoming feminized. The study also revealed that agriculture is predominantly becoming the activities of aged peoples.

5. 6 Land Tenure

Land tenure refers to land holding rights, including land that is passed on through inheritance, through a loan or rent for an established exchange value, or through an outright sale (Davis, 1988). The present nominal land entitlement of farm households

has gender sensitive effect. Informants reported that traditionally females in most of the cases do not inherit land as lineage members. Rather they only obtain land as wives through their husbands' lineage. Likewise, women in the presence of their husband do not have the ownership right for land that is allocated by government. Not only women, but also girls when they are under their family control they do not demand share of land either from the parents or from the government. The absence of land ownership rights devoid them the predominant resource, land for collateral rights in up take of different agricultural credits. Therefore, land ownership has been traditionally accepted as complete gender determined phenomenon in the study districts of Oromia. Probably attached to the prevailing farm household land entitlement system, currently women do not have far-reaching vision with regards to involve in natural resources conservation, to fulfill daily household needs and to overcome poverty pressures.

Similar report by Filintan (2003) indicated that in Africa in particular, societies confer only secondary, usufruct rights to women. Women are normally entitled to cultivate land controlled by their husbands' lineage but not to alienate or inherit it. She further pointed that men control nearly all the property and decision relating to it.

According to land policy of Federal Democratic Republic of Ethiopia, land is of government and public property. The ownership belongs to government while people have only use right. Farmers are conscious of that land is government's property. They

were given land use right and precluded ownership right. To this effect a question was raised to the respondents that whether this nominal right has an impact or not. The majority of farmers were responded that its being governments property does not have any negative influence on use plan, management, conservation and long term investment. While few farmers disagree with the attitude and claim that it has significant negative implication on appropriate conservation and long-term investment. One can imagine that these farmers assertion may be attributed to the scaring of the existing local political systems and perhaps due to lack of knowledge of its long term impact on the environment and future generation welfare, otherwise the provision of use right alone does not satisfy human beings natural ownership need of resources.

On the other hand, professionals disagree with the present land policy and suggest land privatization to encourage sense of ownership and thereby facilitate conservation of natural resource and long-term investment to ensure sustainable economic development. Basically sustainable economic development is beneficial to maintain social progress, to finance preservation of the environment and to permit people to divert more energy from survival to political participation. In contrast to this, government officials claim that privatization of land cannot guarantee natural resources conservation and sustainable economic development. Rather they protest that if land is privatized, the overwhelming majority of poor smallholder farmers of the country will sell their farmlands and become landless. The land would be accumulated

at the hands of the rich. Then, the landless poor migrate and ultimately become jobless citizens.

Thus, the present land tenure system is so observed to be controversial issue. Therefore, to reconcile those two ideas (governments and professionals), there is legitimate concern to analysis of the current land policy based upon the experience of African countries of similar background with Ethiopia. Besides, involving Ethiopian farmers to discuss on the issue and identify the beneficial one based on the choice of the majority. Further more, we recommend the fast and through discussion on the issue of the existing land policy cons and pros with concerned peoples and professionals and thereby to suggest tangible solutions on Ethiopian context.

It is also interactive to note that besides the land policy significant proportions of respondents claimed that there is pressing land shortage and poor quality of land for enhancing agricultural development and feeding of their families. It is a truth that in developing countries like Ethiopia where large proportion of the population are attached to land to sustain their life, true access to quality land determines families food security, income, social status and political power.

5. 7 Land Use System

In the study districts, land use system operates under traditional mixed crop-livestock farming system. The land use system of farm

household broadly classified into crop production, livestock production, and tree plantation based upon traditional experiences. It was also noted that small patches of small controlled and non-controlled natural forests were sporadically distributed over the districts. On average, crop production occupies the largest proportion of land, followed by livestock production and in rare cases tree plantation respectively. Fertile and good quality lands allocated for crop production when very small plots and marginal lands reserved for grazing. Farmers usually cultivate their plot of land year after year to grow diverse species that suit their localities to feed their families. As to today, there is no option for shifting cultivation in the areas as most potential lands were already put under cultivation and grazing. Perhaps hardly rotation of crops for traditional soil fertility restoration occurs. In addition, it is hardly possible for the majority of farmers to fertilize their plots due to escalating prices of inorganic fertilizers. As a result soil fertility decline and natural resource degradation were observed to be the critical problems for the agricultural development in the study districts. Improved seed price was also heightened and the delivery is untimely. Thus, due to these cumulative effects the use of improved technologies become far beyond the reach of most poor smallholders farmers except for few crops, maize and wheat.

Farmers of the study districts have been rearing large number of local livestock breeds for different purposes, predominantly for draft power, milk and meat production. The size of livestock population is high, despite its limited economic contribution to the

farm household. Essentially, these could be attributed to storage of feeds and poor healthcare management. This huge livestock population was observed to be above the carrying capacity of the land. This has posed tremendous pressure on natural resource base of the area. On the other hand, improved livestock breeds and its management technologies have been generated through research, but beyond the reach of poor smallholder farmers. This may be because of the feed and management demand of this improved livestock is relatively higher than local breeds. Having this fact on the ground, improved livestock technologies were not multiplied and distributed with the price that poor smallholder farmers could afford and in the required amount as well.

Farmers usually plant trees, practically for construction and fuel wood purpose as boundary plant or woodlot on small plots of land. Of the trees, eucalyptus is vigorous and widespread across the districts. Farmers usually left some trees on their cropland and at borders of their farmland for different purposes, fuel wood, bran construction soil and water conservation, beautification and environmental conservation. Currently, it was observed that most natural forests have been under critical threat more than ever, hence eucalyptus observed to be replacing the most indigenous tree species.

According to the prevailing land tenure and land use system arrangement, the first priority concern of poor smallholder farmers are to feed their family and overcome the prevailing rural poverty by integrating mixed crop-livestock production practices. The

second priority concern of rural farm households is sustainable cash generation for household expenditures, payments of tax and credits. The third priority concern is to obtain fuel wood and construction materials from an "open access" forest and through boundary or woodlot plantation. In the course of achieving their objective tremendous pressure were put on natural resources, the land and forest of the areas. In line with this, most farmers poorly conserved their crop plots, forest fields and few were planted trees. Rather, natural forest were indiscriminately cleared, water erosion of crop fields found high, rural pathways were extremely narrow and become gully, and sloppy lands which deserve proper conservation or tree plantations were put under crop production and grazing. In overall, at present most of the earlier existing natural forest get cleared and farmers rarely practice tree planting. The "open access" to land and natural forests also favors more marginal land cultivation and further destruction of natural resources. Therefore, it is not land tenure that matters more, but lack of supportive policy that facilitates land capacity classification and land use system, besides the generation of cost effective and labour saving technologies for the poor small holder farmers.

The land tenure and land use system control over is totally belongs to the head of the household, men in the majority of cases 80.8 % for Cheliya, 89.4 % Jimma Arjo and 86.6 % for Jimma Rare, while other household members, women, girls and boys have nominal access for use. Thus, in the men headed household land entitlement is to the men or the head and hence land use system, therefore, determined by him. It is also important to know that

there are differences in land use access among the household members based on differential control of powers over the resources. It further noted that because of limited control over the resources, there could be negative impact on efficiency of the resource use in that the skilled and energetic household members, the young (boys and girls) may not be allowed to use the land based on creativity and innovative ways as they do not have control over resources.

In some high lands of the study districts for instance in Jimma Arjo, land is largely owned by old peoples, while the young who are energetic to work and improve agricultural productivity and as well able to conserve the natural resources are landless or holds very small plots of land, less than 0.25 ha. This type of constraints perhaps may exist in vast majority of Oromia in particular and Ethiopia in general, which demands strategic solution like land reallocation.

6. RESULTS

6.1 Household Demographic Characteristics

The respondents reported that the current population increments of the communities are disturbing over all the study districts. The probable reason behind is that, the majority of the deadly diseases of the early days like gonorrhea, syphilis, measles and typhus were completely eradicated.

The other reasons are that there is early marriage between couples, illegal childbirth, and religious effects: stopping birth or using pills regarded as killing. Social values: giving more attention to boys than girls, therefore, they don not want to stop giving birth till they have enough boys in the household. Poverty: considering children as assets; to get more income by letting them to work as a wage labourer. Lack of recreation center and facilities (TV, radio and the likes) were also considered as the most important reasons. Interruption of using contraceptive pills, and there is also a fear that using pills will expose women to different health problems like gastric disease and disturbance of menstrual cycle. According to the local community, there has to be a good diet when using pills, but they claimed that, even there is no food to feel their stomach.

The key informants felt that, today social change is much more rapid and though few, currently birth control strategies such as trainings and services are underway. Therefore, through intensifying and sustaining the initiated family planning

interventions, it is possible to decrease the present population growth rate or maintain the present population in the near future.

6.2 Age and Sex Versus Physical Activities

The study depicts that girls start physical activities earlier than boys invariably across all the study districts. In overall, children less than seven years and aged peoples above 60-70 years have been considered to be incapable to undertake physical activities, while 8-70 years aged groups of people are referred to be active in performing any physical activities. The incapability of aged peoples, however, influenced by health condition, earlier strength and nutrition. It was also noted that little variations might exist among the districts (Tables 5 and 6).

It was reported that on average females start physical activities early at an average of seven years and stops at about 60 years, while males start at an average age of 10 years and stops at about 70 years. The reasons for early stop in physical activities for females were reported to be due to domestic drudgery such as food preparation, fetching water, delivery, breast-feeding and childcare, besides involvement in different productive, reproductive and community roles. It is instructive to note that women work longer hours on average 16-18 hours per day like in any developing world, while male works 8-10 hrs. Even though it is women who get early weaker to undertake physical activities as mentioned above, however, they never cease labour force until age fail them. For instance, the males themselves claimed that carrying children

on their back, women weed, cook food, go for marketing; long distances and the likes. This all drudgeries of workload on women contribute for their early stop of activity. Of course, from this study we discovered that gender discrimination begin at an early age for females. They are considered as adult at a very younger age than males. As a result they usually did laborious household chores at their early age. They are often required to stay indoors helping their mothers. They are educated from early childhood that they should be passive, shy and non-assertive. Most of them get married before they complete their education without their will. Even if females enroll to school, due to enormous workload, more roles and responsibility at home and lack of support from teachers and parents they are less likely to be successful at school.

Table 5. Age and sex proportion of Jimma Rare district population

Gender	Age category	Proportion	Percentage
Male	<7 years	16,681	26.2
Female	7-70 years	46,706	73.4
Average	> 70 years	240	0.4

Table 6. Gender based physical activity condition of the population over the study district

District	Gender	Activity condition		
		Age at start	Active ages	Age at stop
Cheliya	Male	10	10-70	70
	Female	7	7-60	60
Horro	Male	10	10-70	70
	Female	8.5	8.5-60	60, at death
Jeldu	Male	12	12-70	70
	Female	8	8-50	50
Arjo	Male	10	10-70	70
	Female	7	7-60	60
Rare	Male	8.5	7-50	50
	Female	7	8.5-60	60

6. 3 Asset Ownership and Power Control

For the sake of this investigation land, livestock, tree plantation and its product, seed and crop produce are considered rural asset (property). Asset ownership, its use and power control totally belongs to the head of household, men in the majority of cases: 80.8% for Cheliya, 89.5% for Horro, 67% for Jeldu, 89.9% for Jimma Arjo and 86.6% for Jimma Rare, while household members have nominal access for use. This implies that the leadership and domination of power by men provides several privileges over women in the community. To deprive a person of property is to deprive him or her of life (Juma and Ojwang, 1996).

On the other hand, there is no difference in the size of land holding between MHHs and FHHs as land distribution has been made once during 1974 when the Derge regime overtake the feudalist system. The ownership was once registered during then under the head, men or women, and hence no land distribution was made afterwards. In fact, some household head women reported that their neighbor men household heads push them from their cropland, pasture land and forestlands in to marginal lands. And also they further reported that if they left their land fallow for some time the communities would overtake them for communal grazing land.

The average land holding size recorded was 2 hectares across the districts with the range vary from 0.5ha-12ha. Land shortage was anonymously reported across the study districts. However, the

problem was really critical in Cheliya and Jeldu districts. The livestock populations reported vary from 8-32 including all types of domestic animals, chicken excluded.

The control over of farm resources such as land, livestock, work, credit, time, capital, and technology is by the head of the households, men in most of the cases, while every member of the family has nominal use access. Crop production and livestock control over is mainly men's domain, while chicken and some times small ruminants control over belongs to women and children. Politics and informal education usually controlled and accessed by men, head of the household. Both men and women have their own specific equipment control over based on their roles and responsibilities. Both rural and urban employment may exist for either of the household members based on their practical knowledge and skill. But it is important to point out those young girls and boys have predominance to formal employment after school completion as compared to the adult. For long, women were not allowed to own property in many cases. Even if they possess certain property before marriage, they usually lose the ownership right automatically when married. Often, women have little say in decision-making of resource control over that affects their lives. These all power control privileges were culturally given to the men with its full authorship.

The control over of land use system is also by the head of the households. Most head of the households do not allow the participation of the household members in decision making of land

use system because of afraid of loss of power control over the resources. Especially men afraid much when children get matured that they may overtake the control over of the resources (asset) along with their mother. And also men complained that women's despise them when children become matured.

In overall, currently the participation of household members with regard to decision making were non-exist and as a result the young members of the household become outsiders and do not involve in planning, designing and implementation of agricultural and development activities. Thus, due to lack of transparency and equal participation in decision-making process among household members, the land and the human labour of the rural communities often inefficiently utilized. Hence, in rural farm households the process of decision making and the participation of members that could contribute much of proper allocation of natural resources and human labour need to be strengthened through different training and promotion mechanisms.

Table 7. Farm household access to and control over resources

Types of resources	Access to	Control over	Factors influencing
Land	M,W,B,G	Head, M/W	Cultural, legal support
Equipment	M,W,B,G	M/W	Culture
Work	M,W,B,G	Head, M/W	Culture
Credit	M,W	Head, M/W	Legal support, culture
Politics (leadership)	M	M	Cultural, legal support
Time	M,W,B,G	Head, M/W	Culture
Capital	M,W,B,G	Head, M/W	Culture
Education	M,W,B,G	Head, M/W	Cultural, legal support
Employment	B,G	B/G	Culture
Technology	M,W,B,G	Head, M/W	Cultural, legal support

Remark: B-for boys, G-for girls, M-for men and W-for women

Source: key informant interview and group discussion, September 2004.

6. 4 Access to Credit and Extension Service

In principle there is no disparity between MHHs and FHHs in terms of access to credit and extension services. However, during this data generation sizeable differences have been observed in the communities. For instance during 2003 cropping season, 5665 MHHs (51.4%) and 316 FHHs (25.6%) have been participated in extension services in Jimma Arjo district. Not only that ever in the household there is no policy or legal constitution that discriminates between wife and husband access to credit and extension services in rural communities as long as they are legally married. On the contrary, there is also no legal document that states that wife and husband has equal right by the law to control and use land resources, to access credit and extension services.

The probably reason for poor access of FHHs to credit and extension services may attribute to the fact that women afraid to talk to male extension agents, lack of time to participate on different official and local meetings, lack of time to listen to radio programs besides lack of radio and television. Furthermore, relative poverty and less frequent visit by extension agents and less technical assistance offered also considered. In spite of the women provide overwhelmingly large proportion of contribution for livestock and its product management, and crop production in the community, the extension services rendered did not differentiate the appropriate client. Rather men involve indiscriminately in all types of informal trainings that usually offered in the rural community. Similar report indicated that in the Caribbean, women

are often over looked when technical assistance is provided, even though they are involved in cattle management and milk production, simply because they do not conform to the expected stereotype of "the farmer" (FAO, 1983). In both Kenya and Tanzania the study showed that extension agents visit female-headed farm households less frequently (Broch-Due, 1988). In Egypt, only one in five rural women with small land holdings was able to meet a male extension worker directly; most often women obtained information through television or public meetings, and some times from their husbands (Loza, 1992).

It was felt that cultural stereotype and tradition may preclude women's access to credit and extension services. It was further observed that women do not allowed to access credit and extension services at the presence of men or husband due to lack of collateral right, land entitlement right and asset ownership right. It means, at the presence of men, officially women lack access to credit and extension services. This indicates that there is legal discrimination of access to credit and extension services between women and men or wife and husband in the community.

The withholding of finance by men also affects women's access to technology. Women farmers often are, or perceive themselves to be, restricted to low technology farming because they can not afford purchased inputs (like fertilizer, herbicides and seeds). As reported by different writers that one of the stereotypes of women is that they are concerned with stabilizing household subsistence needs than with cash income. The empowerment of women in some

countries has accompanied by their increased participation in the cash economy and a growing number of organization and women's cooperatives that give loans to women at affordable interest rates. Therefore, reformation in rural credit policies and institutions to promote women access to credit and extension services would help in improving women's efficiency in agriculture.

6. 5 Household Level Food Security

At the household level, food security is directly influenced by agricultural performance. It was noted that there is wide disparity in food security between MHHs and FHHs. In most of the cases, MHHs are relatively better food secured in rural communities. On the contrary, FHHs face multiple constraints in serving adequate food for the family. This is mainly because of the contribution of men as head; good planner, manager and implementer of the agricultural activities are missing. Hence women in FHHs shoulder double roles and responsibilities. Foremost among them are those rooted in the gender separation of farming and family maintenance responsibilities. This highlights the need to readdress the biases against women farmers in access to extension, credit and technology.

In fact, it is important to note that yet the women shoulder more responsibility than men even in MHHs. Women usually responsible for childcare, nurturing, shopping, cleaning and arranging the beauty of the house. They are also good experts in saving and proper management and utilization of resources, and engage in

laborious physical activities. In overall, they are chief experts and managers of the household as compared to men. Often females do not participate in alcoholic drinks and other social entertainment because of they feels more responsibilities, shortage of time and cultural taboo.

Usually tremendous transitory food shortage is observed in the districts. This is may be due to the mismanagement of the produce, dwindling of food stocks after planting, erratic rainfall, poor soil fertility, disease and pests, poor adoption of improved agricultural technologies, late maturity of crops, natural resources degradation and high population increase, which ultimately leads to poor productivity of crops and livestock. Largely, this transitory food shortage occurs in the highlands due to shortage of cultivable land and late maturity of food crops. It was observed that this transitory food shortage is magnified for the landless farmers, as log as the chance to obtain traditional employment during this season is rare, and the rise of the price of the produce.

Fortunately, in the early days producing early season crops such as potato, Kale, Anchote and early season barley bridged this transitory food shortage gaps. But currently due to the late start of rain, land scarcity and erratic rainfall condition, the production of the early season crops become difficult. However, improved potato variety, Menagesha was found tolerant to moisture stress, and as a result it has been the most promising in moisture stress years once established. This improved variety, however, was not yet reached the overwhelming majority of smallholder farmers due to

lack of organization that take the responsibility to multiply and distribute the improved seeds.

Table 8. Criteria for categorizing the farm households into different wealth status in Cheliya district

Household wealth status		
Poor	Medium	Rich
-Landless	-Less than ten total cattle	-Greater than ten total cattle
-No cattle	-Less than two pair of oxen	-Greater than 2 pair of oxen
-No oxen	-No contract land	-Owner of contracted crop land
-No good house	-No surplus produce	-Owner of contracted grazing land
-Food insecure for longer period	-Less than 15 ewes	-Seed owner for plating
-Poor clothing	-Fair clothing	-Share cropper
-Large family size	-Good thatched roof house	-Greater than 15 ewes
-Poor resource use	-Fair food	-Good clothing
-Share cropping	-Less than 4 female horses	-Good corrugated roof house
-Land renting	-Transitory food shortage	-Good food year round
		-Greater than 4 female horses
		-Year round food self sufficient

Source: key informant interview and group discussion, September 2004.

Table 9. The proportion of farm households' wealth status in Cheliya district

Type of household	Household wealth status		
	Poor (%)	Medium (%)	Rich (%)
Female headed household	100	0	0
Male headed household	76.5	18.8	4.7
Total household	75	20	5

Source: key informant interview and group discussion, September 2004.

Table 10. Sources of income for different farm households in Cheliya district

Poor	Medium	Rich
-Wage labour	-Crop production	-Crop production
-Petty trade	-Livestock production	-Livestock production
-Cottage industry	-Petty trade	-Perennial trees
-Local alcohol	-Local drinks	
-Fuel collection	-Perennial trees	

Source: key informant interview and group discussion, September 2004.

Table 11. Criteria for categorizing the farm households into different wealth status in Horro district

Household wealth status		
Poor	Medium	Rich
-Landless	-Medium size of landholding	-Best clothing and sanitation
-Small size of landholding	-Food self sufficient	-Good food
-No cattle	-A pair of oxen owner	-Good corrugated roof house
-No oxen	-Good clothing and sanitation	-Some concrete floor
-No food	-Good thatched roof house	-More than 2-3 pairs of oxen owner
-Poor clothing	-Transitory food shortage	-More than 3-4 dairy cows
-Food insecure for long period		-Owner of surplus crops to borrow
		-Owner of surplus money to lend
		-Large size of landholding

Source: key informant interview and group discussion, September 2004.

Table 12. The proportion of farm households' wealth status in Horro district

Type of household	Household wealth status		
	Poor (%)	Medium (%)	Rich (%)
Female headed household	16	81	5.4
Male headed household	13	80.1	6.6

Source: key informant interview and group discussion, September 2004.

Table 13. Criteria for categorizing the farm households into different wealth status in Horro district

	Jimma Arjo	Highland PAs
MHHs	10%	70%
FHHs	7%	90%

Source: key informant interview and group discussion, September 2004.

The proportion of transitory as well as permanent food shortage has been reported to be higher in the highlands of Jimma Arjo district like in Hindhe PA, Haraa PA, Tibbee Caffee PA, Haraa Keekkuu PA, Tibbee Kusaayee PA and Haroo Qumbaa PA. It was noted that about 20% of the highland farm households of Jimma Arjo face permanent food shortage. This permanent food shortage mainly exists in small town, like in Jimmate and on the main

roads from Nekemete to Bedele. This is because of most farmers of the area involves in wage labour, sales of charcoal, grass and fuel wood. In summary, food shortage happens due to the following factors:

- Large family size,
- Small number of active working groups (most of the household members engage to school),
- Majority of aged farm households who can not undertake physical activities,
- Due to unplanned birth of widow with many men as a result lack of support in childcare,
- Land scarcity and landlessness.

6. 6 Transitory Food Security Crops

Farmers reported that kale, potato, Anchote and early season barley (Samareta) are the most vital food security crops because of their early maturity coincides with seasonal food shortage. To overcome transitory or permanent food insecurity, the following technical and strategic solutions were suggested.

- Allocation of sufficient budget and logistic at district level,
- Provision of dependable credit and extension services,
- Involvement of well skilled man power of crop, livestock and natural resources specialists,
- Timely delivery of improved seeds and fertilizers and
- Professional coordination is highly envisaged rather than political commands for successful implementation of extension activities.

Farmers reported that culturally assigned gender roles and responsibilities would automatically change when rural farm households face food insecurity. In food unsecured farm household, women become more responsible with different roles besides their routine reproductive and productive roles. The women tend to be wage labourer, fuel wood collector for sale, and manager of household and credit taker. Since they are domestic dwellers they suffer much with household problems. They are responsible for childcare, feeding and house maintenance, while the men wonder everywhere, to find self-security, but not feel much of about their households. On the other hand, in food secured family the roles and responsibilities of men and women remains unchanged. They undertake their normal activities and responsibilities traditionally bestowed up on them.

6.7 Major Crops Production and the Limiting Factors

The key informants reported that much difference does not exist between MHHs and FHHs in types of major food crops produced including transitory food security crops. Barely, wheat, potato, faba bean, field pea, rapeseed and linseed are the major crops produced by both MHHs and FHHs in the communities of Cheliya district. The major crops grown in Horro and Jimma Arjo districts by both MHHs and FHHs in order of importance were wheat, barely, tef, faba bean and field pea. The major crops produced in Jimma Rare are wheat, maize, Niger seed and linseed by MHHs and maize, tef and wheat by FHHs. However, MHHS and FHHs reported to differ in their objectives of producing those major

crops. MHHs produce major crops for both food security and income generation, while, FHHs produce major crops mainly for the purpose of food self sufficiency. Moreover, FHHs more affected by lack of knowledge, shortage of labour and hunger than MHHs. That is the reason why FHHs focus on food-self sufficiency crops.

As to the factors limiting the major crops production that there exist differences between MHHs and FHHs. The major crops production limiting factors noted in MHHs in order of importance were small land holding size, bad weather condition, high price of fertilizer, market fluctuation, lack of appropriate and timely delivery of inputs (fertilizer, seed, etc.,) and lack of knowledge. On the other hand, FHHs reported were lack of credit, shortage of labour, lack of knowledge, bad weather condition, high price of fertilizer, market fluctuation, lack of appropriate and timely delivery of inputs.

6. 8 Potato Production and Its Limiting Factors

Both MHHs and FHHs have similar perception of potato production in terms of value in relation to other food crops. In a family headed by men, also both men and women have similar perception of potato production. Hence potato production has been considered as the first priority compared to other food crops because of its contribution to food security, income generation, and double cropping advantages and its utilization in different forms. Likewise, the key informants and group discussion participants reported that there is no difference between MHHs and FHHs in choice of

the types of horticultural crops grown in the area. Hence, potato, kale, garlic, onion, carrot, beetroot and cabbage were reported to be the major horticultural crops in order of importance.

As to the limiting factors for potato production, the key informants and group discussion participants reported that there exist differences between MHHs and FHHs. The limiting factors reported for potato production in MHHs were market fluctuation, lack of cooperatives and lack of training on potato production, storage and utilization. On the other hand, lack of labour for fencing and plowing, market fluctuation, lack of cooperatives and training on potato production, storage and utilization were reported as limiting factors for potato production for FHHs. Labour for fencing and plowing were regarded as critical constraints for the FHHs. Similar reports indicated that there exist differences between MHHs and FHHs in the types of local strategies applied to alleviate the limiting factors of potato production. For example, to alleviate lack of training on potato storage and production, MHHs used trained neighboring farmers in constructing DLS from locally available materials, in ridge making, row planting and storage of seeds. On the other hand, FHHs hire local labour if they have oxen and involve in sharecropping if they do not have oxen to alleviate critical problem of labour shortage for plowing and fencing.

The key informants and group discussion participants reported that both MHHs and FHHs produce the same type of varieties across ASARECA/CIP assisted potato project districts. In Horro district farmers reported that 10 t ha⁻¹ potato tubers could be

harvested from potato variety Tolcha under residual moisture locally called "bonne". Tolcha and Menagesha were reported as the two improved potato varieties widely produced with 140 t ha⁻¹ and 240 t ha⁻¹ estimated yield respectively at Jimma Arjo. On the other hand, farmers of Jimma Rare expressed that Menagesha produce an estimated yield of 200-400 t ha⁻¹ while local and potato varieties brought from Ambo produce 80-100 t ha⁻¹. The reasons for both MHHs and FHHs to produce those improved varieties were reported to be the contribution of the varieties for household food security, market value, disease and pest tolerance and yield advantage over the local varieties.

Farmers reported that, they locally employed different indigenous strategies to over come most of the potato production set backs such as:

- Use of trap plants and hand picking for control of insects especially red ants
- Supply of FYM and crop residues of faba bean, field pea and barley to mitigate soil fertility problems
- Land renting and share cropping to over come land shortage
- On-farm selection of health and quality seeds and some times purchase of seeds from local market to overcome lack of improved seeds and
- Fencing and guarding to reduce wild life damage.

Table 14. Criteria for categorizing farm households into wealth status in Jimma Arjo district

Poor	Medium	Rich
<ul style="list-style-type: none"> - 0.25 ha of land - No sheep - No oxen - May or may not own poultry - Wage labourer - Poor sanitation of feeding - Poor clothing - No children go to school - Yearly hand to mouth food - Poor land management - No technology adoption 	<ul style="list-style-type: none"> - 0.5 ha of land - 1-5 sheep - A single or a pair of oxen - Some his/her children go to school - Five months of food self sufficiency per year - Medium housing (may be by iron sheet or thatch - Medium family size - Tries to be rich - Medium with all aspects 	<ul style="list-style-type: none"> - > 4 pairs of oxen - > 10 cattle - > 3 ha of lands - > 10 quintals of produce - All his or her children go to school - Good technology adopter - Risk taker in technology adaptor - Iron sheet corrugated

6. 11 Soil Erosion, Degradation and Conservation Strategies

Most of the highlands of western Oromia are vulnerable to soil erosion. Farmers reported that erosion is happening in the study areas with increasing rate due to lack of permanent soil conservation structures, continuous cultivation, occurrence of erratic and intensive rainfall, improper cultivation and indiscriminate clearing of forests.

On the other hand, they reported that potato production has great contribution to the minimization of erosions or conserving soil and water. But this has not far reaching effect due to the fact that potato production is usually done on small plot; hence its effect is limited to nearby small and down side plots. The merits may be attached with ridge or mound making, early establishment and ground cover by potato plants. Accordingly, the contribution of Menagesha and Tolcha was estimated to be 90% and 75%

respectively, in reducing soil erosion hazards based on their growth morphology, early establishment and good ground cover.

Loss of soil, soil fertility decrease, crops destruction, crop productivity decrease, loss of houses or building and gully were reported as main negative impacts of erosion in both MHHs and FHHs in the area. The situation was reported to be severe in FHHs in the area because of lack of labour to take soil and water conservation measures. Heavy rainfall, cultivation of sloppy land, soil type, plowing up/down, overgrazing, over cultivation and lack of fallowing, ignorance and forest clearing were reported to be perceived causes of erosion in both MHHs and FHHs in the area.

Traditionally different conservation methods like terrace making, contour plowing, tree planting, grass strips, ditch making, gully checks and "yaa'a baasuu" were reported as strategies followed by both MHHs and FHHs in the area.

7. GENDER DIFFERENTIAL ROLES IN AGRICULTURE

For all the study districts, there has been observed similar gender differential roles in agriculture, though there exist very small variations among them. The invisible women's roles and responsibilities are documented for further unveiling their contribution for natural resources management (NRM) research and development planning, designing and implementation interventions. It is prudent that women across all the study districts work longer hours per day, however, it is difficult to distinguish between productive and reproductive roles of women as they involve in several activities in that the time taken is difficult to record.

The respondents reported that in the study districts the members of the households' men, women, boys and girls have significant divisions of labour and contribution in agricultural activities. Plowing, harvesting of some crops, house construction, fencing, tree planting and kraal rotation are regarded as men and boys duty, while activities like milking, barn sanitation, and poultry keeping as women and girls activities. Even though males may assist, women mainly handle the activities like weeding, "messa", collection of harvested crops and harvesting of beans and flax. Girls in the absence of boys do involve in guarding of livestock. Boys and girls also involve in poultry and sheep rearing as an activity next to women.

The respondents reported usually men and boy involve in crop production, while boys in livestock production as a wage labourer. Off farm activities like petty trades and cottage industries are the activities involved by everyone in the household. Making local drinks and souvenirs are the duty of women and girls.

Land preparation, weeding, hoeing, collection of harvested crops from the field to threshing areas, barn sanitation, poultry and sheep production and guarding of small animals, sheep and goat are regarded as women's activities, while both tend to be responsible for guarding, collection of crops to store, marketing and livestock feeding activities. Nevertheless, the support of women for most men's successful accomplishment of their roles and responsibilities is inevitable. The respondents further informed that some horticultural crops production like onion, fenugreek, beetroot and head cabbage is regarded utterly women's activities. Feeding of milking cows, poultry, and kids of milking cows and sheep and sick animals' management are also the roles of women. In addition, they reported that soil erosion conservation, riding and water drain, land preparation and packing by human labour are greatly executed by females, while males usually undertake plowing and packing of tef fields.

In case of crop production, members of the poor farm households, boys, girls, men and women may participate as hired labour, while in livestock production only boys may involve as hired labour. Off-farm activity like petty trade usually practiced by either of the household members boys, girls, men and women especially in poor

households. But trade of livestock mainly employed by men. Off-farm activities run by either of the rural household members like blacksmithing by men and boys, while pottering mainly by women and girls, and lumbering by men. Women and girls, predominantly in the less to do families make local drinks like "arake" and "farso". Usually mates, hats, etc by men or boys and house furniture like "gunddo", "gingilichaa" and others by women or girls are gendered off-farm activities made by either of the household member.

Traditional saving, "quqqubi" and local social organizations like "quccubee", "afoosha", "maabara" and "dugiddee" are the prominent community group roles run by either of the household member. *Dugiddee* is a social organization or work group mainly required to help the member of the groups equitably during plowing, weeding, harvesting crops, collecting crops and house construction. The traditional social organizations, quccubee and maabara principally established to help the member of the groups equitably during funeral and marriage ceremonies in terms of provisions of money and physical services. Traditional saving, quqqubi is predominantly practiced by women and girls, though the type of individuals engage may differ from community to community mainly to accumulate and save money for some uses. There is also participation of household members in marriage and funeral ceremony, but now a days marriage ceremonies are not much celebrated because of economics and awareness trainings given by different organizations. The study reveled that wealth influences gender based division of labour either positively or negatively.

From overall farm household activities, crop production shares the largest (45%), followed by domestic work (30%), while livestock production accounts for (25%). Hence, accordingly women contribution accounts for 36.04% and men 35.2%, while the rest 29.68% shared by children (boys and girls) for the overall farm household activities. Women were responsible for livestock rearing, crop production and domestic work, 35%, 22.5% and 61% respectively, while men did 30% of livestock work, 6% of domestic and 53.5% crop production work (Tables 15, 16 and 17).

Table 15. Gender based livestock husbandry activities

Type of activities	Gender				Total (%)
	Boys	Girls	Men	Women	
Preparation of feed	-	-	5	5	10
Feeding	2	-	4	4	10
Guarding	16	4	-	-	20
Health care	-	-	7	3	10
Milking	-	-	-	10	10
Milk processing	-	4	-	6	10
Burn rotation	5	-	15	-	20
Burn cleaning	2	2	4	2	10
Total	25	8	30	35	

Table 16. Gender based crop production activities

Type of activities	Gender				Total (%)
	Boys	Girls	Men	Women	
Plowing	5	-	15	-	20
Planting	2	1	5	2	10
Weeding	3	3	2	7	15
Harvesting	1	1	10	3	15
Transport to trashing field	1	3	1	5	10
Trashing	3	1	5	1	10
Cleaning	3	1	5	1	10
Transporting to store house	3	1	5	1	10
Soil and water conservation	2	-	3	-	5
Marketing crop produce	-	-	2.5	2.5	5
Total	18	11	53.5	22.5	

Table 17. Gender based domestic activities

Type of activities	Gender				Total (%)
	Boys	Girls	Men	Women	
Fetching water (10%)	1	2	-	7	10
Fuel wood collection (15%)	3	3	2	7	15
Food preparation (30%)	2	8	-	20	30
Childcare (20%)	1	3	3	13	20
Sanitation and cleaning (15%)	2	5	-	8	15
Marketing and shopping (7%)	1	1	1	4	7
Milling (3%)	0.5	0.5	-	2	3
Total	10.5	22.5	6	61	

8. GENDER DIFFERENTIAL ROLES IN POTATO PRODUCTION

Gender desegregated roles and responsibilities of household members in potato production, utilization, marketing and natural resources, soil and water management were investigated in three districts of East Wollega and two districts of West Shewa Zones. The most useful finding from this investigation is that gender related roles invariably hold over all the study districts and hence, narrative summary of the findings are presented here under (Tables 18 and 19).

Traditionally, potato including some other horticultural crops such as onion, garlic, cabbage, fenugreek, red beat, carrot, and pepper are regarded as women's crops. This idea has been evolved may be because women tend to be limited to dwell around the homestead, where these crops are usually grown. But documented information is scanty pertinent to gender based roles, indigenous technical knowledge and skills of farm households. Therefore, this study prompted to generate differential roles and responsibilities of the household members and reasons why it has happened that way.

Table 18. The gender based labour contribution for potato production

Type of activity	Percent share	Gender share (%)			
		Boys	Girls	Men	Women
Land preparation	10	3	0	7	0
Plowing	5	1	1	0	3
Planting	5	1	1	0	3
Weeding	30	4	6	0	20
Guarding	10	2	2	4	2
Harvesting	10	0	2	0	8
Marketing	10	0	2	0	8
Processing	10	0	2	0	8
Seed selection	5	1	0	2	2
Seed storage	5	1	0	1	3
Total	100	13	16	14	57

The study revealed that females labour contribution and time input is as high as 73% pertinent to weeding, harvesting, marketing and home processing of potato, while males contribute only 27% of labour and time input for potato production.

Land Preparation

Land preparation refers clearing, plowing, disking, leveling and breaking down of large clods, It also may includes removal of remnant stalks and none decomposed crop residues, and weeds, applying household garbage or composts or farmyard manures and making the soil very smooth/fine for seed tubers to emerge. Land preparation is making of seedbeds, rows, and ridges or furrows where to plant potato seed tuber. Men usually do plowing activities in potato production systems.

Table 19. Roles and responsibilities of household members in potato production, utilization, marketing and natural resources, soil and water management across districts

Types of activities	By who	When	Why
Plowing	M,B	Jan. to March	Cultural influence
Land preparation and planting	W,G,B	March	Efficiency and effectiveness Men's participation in other activities
Weeding	W,G,B	Ranges from 2-4 weeks after planting depending on rainfall and variety	Efficiency and effectiveness Men's participation in other activities
Earthing up/hilling	W,G,B	After two times of weeding depending on rainfall condition	Men participate in other similar field activities
Disease identification	W,M	Between seedling emergency and full flowering	Male has rich experience and joint responsibility
Disease control	M	Between seedling emergency and full flowering	Culture and more access to extension and communication
Soil fertility and water management	W,G,B,M	Before and at planting	Efficiency and effectiveness Share of responsibility
Water conservation	W,G,B,M	Before planting	Efficiency and effectiveness
Protection from wild life: fencing /guarding at night	W,G,B,M	Starting from planting date	Natural differences, Family protection, Division of labour
Protection from domestic/wild life in the day: fencing /guarding	W,G,B	Starting from planting date	Natural differences, Family protection, Division of labour
Harvesting	W,G	End of June to Sep.	Culture and experience
Storage	W,G,B,M	Sep. to Jan.	Efficiency and effectiveness
Processing/utilization	W,G	After harvesting	Culture and experience
Marketing	W,G,B,M	End of June to Sep. After Jan. for seed	Efficiency and effectiveness

Remark: B=boys, G=girls, M=men and W=women.

Sources: key informant interview and group discussion, September 2004.

This activity is handled by women, girls, boys and men. The time of handling the activity is between February and March overall the study districts. The rationale for the joint role and responsibility of all the family members was to increase efficiency and effectiveness of the labour in handling the activity. For example while the men making rows for planting with the help of oxen plow, women, girls and boys involve in planting of potato tubers, remove remnant stalks and breaking down the large clods besides good land preparation for improving the germination and establishment of the crop.

Plowing

Plowing is cultivating the plot of land or turning over the soil for appropriate germination and successful establishment of the potato crop. Courageous and well-experienced farmers desire dry season plow. Potato plots that repeatedly plowed during dry season favor vigorous plant growth, health plant and weed free crop stands. This is because dry plowing disturbs weed seed bank and insects pests and exposes them to direct sun light. As potato maturity favors double cropping, traditionally most potato farms are double cropped. This double cropping enhances repeated plow of potato plots thereby expose potato production threatening weeds and insect pests. Perhaps, it could be logically justified that besides its double harvest merits, double cropping is the best mechanism by which usually weeds and insect pests are controlled.

Key informants and group discussion participants reported that, there is no labour and fertilizer requirement difference between MHHs and FHHs. However, the demand for labour in FHHs might not be responded to because of labour shortage in FHHs and the unwillingness of matured boys and girls to abide to the order of women in the family. Moreover, they reported that women are unable to protect their potato farm from wild life at the night as men.

Key informants and group discussion participants reported that there is a wide profitability difference between the local and improved potato varieties production. Hence, improved potato varieties such as Menagesha and Tolcha are highly profitable over local varieties in that order.

Planting

Planting refers to seeding of potato tubers, which are usually pre-germinated in the soil in traditional storage systems or in diffused light store (DLS) in modern storage systems. Planting of potato is usually handled by women, boys and girls while the men is making rows by oxen plow to facilitate planting.

Staggered Planting

Farmers of Cheliya district informed that there is no practical experience and knowledge of staggered planting of potato. On the other hand, key informants and group discussion participants of Horro, Jimma Arjo and Jimma Rare reported that staggered

planting is practiced under both MHHs and FHHs to minimize risks of diseases, pests, and unpredictable rainfall and to distribute income. Moreover, they reported that the decision of staggered planting in MHHs rendered by both male and female without participation of girls and boys. On the other hand, female solely played the decision-making role of staggered planting in FHHs since she is the head of the family.

Crop Rotation

As to the crop rotation experience in potato production, farmers of Cheliya and Jimma Rare districts reported that there is no such practical experience in their communities. On contrary, farmers of Horro and Jimma Arjo districts reported that crop rotation in potato production is a common practice in the area by both MHHs and FHHs. Maize and faba bean are the crops involved in crop rotation with potato. The rotation cycle is usually three years. The rotation sequence is potato followed by faba bean and then maize. The reason for practicing crop rotation is for soil fertility restoration, and control of weed, diseases and pests. Double cropping of potato and winter barley or "Garbu Birra" has also been reported as the common practice in potato production by both MHHs and FHHs.

Weeding/Hilling

Women, girls and boys handle this activity. The time of weeding is after two weeks to a month of planting depending on rainfall

condition. The reason for the joint role and responsibility of all the family members is to enhance efficiency and effectiveness of the family members handling the activity. Even though all the family members involve in the activity, it is undeniable that the contribution of women in the activity is the greatest of all because they are domestic dwellers and potato also most preferably planted around homestead. The contribution of girls and boys in this activity follows that of women and higher than men. In other words, men's contribution in this activity is reported to be minimal as compared to that of women, girls and boys.

Commonly there are three to four times weeding including the first hoeing. Hoeing usually executed after two weeks to a month after planting. Then, two to three times hoeing at two to three weeks interval often takes place until the crop reaches physiological maturity.

Domestic and Wild Life Protection

Damage by domestic and wild life attack is the most critical problem that limits wider area expansion of potato production. Particularly damage by porcupine is the most notable one. Potato also suffers much damage due to trampling of domestic animals. Protection from domestic and wild life is immediately start after plating and continues till harvesting. To reduce the damages fencing and guarding have been usually done by involving men, women, girls and boys. Men and young male play key role in guarding the potato farm at nighttime while day time guarding is

usually handled by women, girls and boys while men involve in other farming activities. Reason mentioned for all the family members to be involved in fencing was enhancement of efficiency and effectiveness. Reasons mentioned for men and young males to play key role in protecting the potato farm at nighttime were natural differences, division of labour and family protection.

Disease Identification

The major role player of this activity differs from district to district. In Cheliya district, women usually take the leading role, while at Jimma Arjo men play the vital role of disease identification. However, the activity was reported to be the responsibility of both men and women overall the study districts. This activity usually performed starting from the date of emergence of the seedlings. In most cases disease development takes place during intensive rainfall period. The reason reported for the men to be prime role player in disease identification in some districts was the nature of event, men's rich experience and better access to extension service. On the other hand, the reason for women to be perceived as vital role player is because of their day-to-day involvement in weeding and frequent supervision of potato farm.

What so ever diseases attack potato, men or women farmers could not able to identify the causative agent so far, because of limited scientific knowledge, rather they collectively name the diseases locally "tortorsa" means rotting. Some times they look for expertise to identify the causative agent and also provide solutions.

Therefore, Research Organization and Ministry of Agriculture and Rural Development must work hard to enable farmers well acquainted with the diseases and their control methods.

Disease Control

Disease control is an activity that mainly handled by men. The time of disease control is closely related with the time of disease emergence. Farmers responded for the reasons why men handling of the activities were cultural influences that limit women to domestic activities, better access and experience of men to the information and the nature of work. For example it may not be an easy task for women to go longer distances and contact extension agents.

The major problematic disease of potato in Ethiopia highlands is supposed to be late blight. Usually there have been limited indigenous strategies for control of this disease. This disease control demands scientific knowledge and skills, like spray of chemicals and use of improved resistant/tolerant varieties. However, during this study we noted that none of the farmers of the study districts, except of Jeldu used chemicals to control the disease. This may be due to lack of awareness about the disease and lack of access to use chemicals. On the other hand, most farmers do not aware of the disease itself.

Soil Fertility Management

Soil is a fundamental resource for the crop growth; the fertility status of soil determines the growth of crops and yield. The economical use of soil for good achievement necessitates the conservation of soil for its sustainable use. Now days poor soil fertility is among the many constraints limiting the production of different species of crops including potato in western Ethiopia. In order to mitigate these problems soil fertility maintenance and replenishment through the use of different artificial and organic fertilizers is of paramount importance.

Men, women, girls and boys handle soil fertility management, though there may be little variations among districts. Soil fertility management can be either before or after planting. The reason reported for all the family members to participate in the activity is to enhance the efficiency and effectiveness. Men play the guiding role in soil fertility management. Invariably over all the study districts, none of potato farmers informed use of inorganic fertilizer except when improved seed and fertilizer supplied to them by Potato Seed Technology Transfer Project of ASARECA/CIP.

Women, girls, boys and men, respectively involve in handling of soil fertility replenishment through supply of manure and household garbage. The manures commonly collected from cattle, sheep, goat, donkey and horse for soil fertility management. On the other hand, soil fertility enhancement by use of crop residue is very vital but not common in Cheliya highland.

Soil fertility management usually depends on the fertility status of the plot and previous crop history. The time of soil fertility management was reported to be before planting to facilitate nutrient release for the crop, since only manure, household garbage and crop residue are commonly used, which releases nutrients slowly into the soil. It is important to note that there is no experience of inorganic fertilizer application to potato plots, traditionally farmers of the district practices kraal rotation on potato plots. Men and young males play greatest role in kraal rotation while women, girls and boys participate in manure application as key actors. The reason reported for all the family members participation in the activity was increase of efficiency and effectiveness in undertaking the activity.

Harvesting

Women, girls, boys and men handle this activity. Women and girls largely involve in manual harvesting of potato for home consumption on daily basis. On the other hand, the bulk harvest of potato for marketing often carried out by male with the help of oxen plough. In general, women and girls to take the greatest share of role in potato harvesting. The time of harvesting ranges from early June to mid of September according to the local calendar of the area.

Storage

One of the crucial problems challenging the smallholder potato-producing farmers is lack of appropriate technology to reserve seeds for the forthcoming cropping season. Potato tuber seeds are living organs with high moisture content. Hence, there should be a proper storage system, which can keep storage losses at minimum and carry products over months.

Potato storage is an activity handled by men, women, boys and girls. Time for storage is immediately after harvest and continues till market time for seed. In other words, it could range from September to March or even more based on planting time of the locality. Usually ware potato hardly stores more than two months. The reason reported for all the family members to be involved in this activity is to enhance efficiency and effectiveness of the family members under taking the activity.

Storage is the process of conserving quality produce from harvest until consumption. Ware potato storage under ambient temperature of tropical condition is practically difficult. However, due to price instability between the production season and off-season, ware potato storage is often suggested by use of improved storage conditions like use of dark room store, pit store under shade and cold rooms. On the contrary, in the study districts, the major potato storage is for seed. Potato seed store often requires frequent supervision, turning up side, cleaning and discarding of diseased tubers.

Three indigenous potato storage practices were reported in the highland areas of Cheliya district through the storage longevity depends on potato variety and climatic conditions. Those indigenous potato storage practices are described as follows:

On floor potato store in the house

Indigenous on floor potato store in a house follows different practices. These are:

- Harvest potato tubers from the field,
- Dry it in open sunny condition by removing the soil from it,
- Search for an open, well aerated, moisture free space in the house,
- Cover the floor with harvested and dried potatoes,
- Follow day to day by turning potatoes from left to right and from right to left and
- Select the sprouted tubers and use for seed.

Properly stored potatoes using this indigenous potato storage technique may stay safely from September to March and even more depending on plating time of the locality.

On-farm potato store in the field

There are two types of indigenous on-farm potato storage mechanisms mainly reported from Cheliya district:

Type 1:

Steps of type 1 on-farm potato storage mechanism:

- Some potatoes left on the field for seed (some plot of potato farm left for seed),

- Seeds protected from any animal damages in the field,
- Then harvested when seed tubers are required,
- Diseased, smaller and weak tuber seeds avoided and health quality tubers selected for seed.

Type 2:

Steps of type 2 on-farm potato storage mechanisms:

- Harvest the stalks of potatoes seed to be reserved in the field,
- Plow the potato field by covering the cultivated potatoes in the next row to the row plowed,
- Sow another crop on the potato field while still some potatoes are being in the field,
- The potatoes are kept in the field until it is needed for seed,
- Harvest the crops sown on the potato field and
- Cultivate the potatoes either to use for seed or sale them for seed.

Potato can be stored on the field by sowing another crop on the potato field while some potatoes being not harvested.

Home Processing/Utilization

In Ethiopia, from the overall potato produce about 10% spared for seed, 15-20% lost in the process of production and the remaining 75% consumed domestically either in fresh or processed forms. Potato often used for food in different forms: boiled, cooked, roasted and as relish with boiled pulses.

Home processing refers to home cooking or making the produce ready for home consumption and by no means refers other than this in the localities of the study area. The processing is mostly performed on daily harvest basis. Women and girls handle this activity. Reason for women and girls involvement in this activity as key actors in the households is due to their rich experience and cultural influence.

Marketing

It was reported that 93.2% of farmer respondents market potato in addition to their domestic consumption. Of the respondents, 65% reported the amount of the produce to be used for market is decided by both men and women in a family, while 22.6% reported by men only and the rest 10.5% by women only.

More than 60% of the respondents reported that women predominantly engaged in marketing of potato produce due to their great responsibility of household expenditure in the family. Based on field survey, respondents explained that 42.2% women only, 22.9% men only and 34.9% both men and women were supposed to be engaged in potato marketing (Table 20).

Table 20. The proportion of farmer respondents to potato marketing and domestic use

Do you practice marketing ?	Districts							
	Arjo	%	Horro	%	Rare	%	Total	%
Yes	94	89.5	86	92.5	73	94.9	253	92.0
No	11	10.5	7	7.5	4	5.1	22	8.0
Total	105		93		77		275	

Table 21. The proportion of farmer gender roles in potato marketing

Who partake in marketing?	District							
	Arjo	%	Horro	%	Rare	%	Total	%
Women	68	64.8	19	20.4	29	37.7	116	42.2
Men	9	8.6	37	39.8	17	22.1	63	22.9
Both	28	26.7	37	39.8	31	40.3	96	34.9
Total	105		93		77		275	

Key: Arjo-represent Jimma Arjo district and Rare represent Jimma Rare district

The reason why men engaged in potato marketing was related with when large areas put under production for commercial purpose, when bulk and long distance market and to a less extent attributed to the domination of men over resources control over. The respondents depicted that there was significant variations among farmers in the amount of potato produce marketed.

Table 22. Gender based decision of the amount of potato to be sold

Who decides how much to market?	Districts							
	Arjo	%	Horro	%	Rare	%	Total	%
Women	22	21.0	6	6.5	4	4.4	32	11.6
Men	21	20.0	32	34.4	13	17.4	66	24.0
Both	62	59.0	55	59.4	60	78.3	177	64.4
Total	105		93		77		275	

Key: Arjo-represent Jimma Arjo district and Rare represent Jimma Rare district

8.1 Adoption Factors

Family size has significant positive effect on potato technology adoption and transfer. This is mainly because of its contribution to overcome the seasonal family level food shortage. The larger the family size, the better the full package of potato technologies adoption was recorded. Better potato technology adoption and transfer was also accounted to better education condition of the household head.

Size of land holding and livestock possession apparently affected the potato technology adoption and transfer. Households with larger land holding size and livestock ownership found fully adopted packages of potato technologies. Similarly, the wealth condition of the household directly affected adoption of potato technologies. The better wealth condition of the farm household, the better the adoption.

The suitability of agro-ecologies for profitable potato seed production tremendously contributed for the magnificent adoption of potato technologies. Access to the research centers and project sites were also greatly benefited in adopting potato technologies. Jeldu district is one of the most important areas, which has been benefited such suitability and access in Ethiopia. However, localities like Cheliya district which is at the border of two research mandate areas had not adopted any improved potato technologies either through ASARECA/CIP assisted potato project or through local technology transfer channels.

Gender related preferences of potato qualities such as early maturity and big tuber size liked for marketing and processing by women facilitated the adoption of potato technologies across the districts. Though the intra-household labour allocation and preference of the technologies never consider during project initiation, the potato being homestead crop, basically managed by home dwellers, women who provide tremendously over 57% labour contribute towards its adoption. Fortunately, the early maturity of

potato coincides with farm household short of cash for household expenditure further encouraged women's involvement in potato technology up take and adoption facilitation. Potato production technology adoption and gender relationships therefore observed to have significant reinforcing effect. Nonetheless, women claimed the lack of power to control over resources predominantly land and cash as result they fail to decide the amount of area to be planted, the type of land and amount of produce to be used for market and domestic purposes. On top of that women were claimed the official and non-official training offered to men for facilitation of clean potato seed production and distribution in participatory manner. This is because of male always participates in every types of training whether it is in their mandate area or not.

Preferred features and potential qualities of improved potato variety that attributed for its better adoption includes:

- Bigger tuber size
- Disease and insect pest tolerance
- High yield
- Moisture stress tolerance
- Acceptable taste
- High market demand
- Good vegetative growth and stand performance

8.2 Impacts of Potato Technology Adoption

The study showed that 89.6% of the respondents noted that there is change in potato production i.e., increase in area of production, quality and market demand enhanced since the introduction of potato technologies through participatory technology promotion. Of the respondents 37.2% liked the variety for its better taste, 26.7% for its bigger tubers and 33.3% for both characters, while 96.1% liked it for its high market demand (Table 23). It was also reported that the traditional gender based potato activities totally changed as the potato crop production become so commercial in the project communities and at Jeldu. Hence, men overtake the commercial potato seed production activities.

Table 23. Change in potato production system after improved potato technology uptake

Is there any change?	District							
	Arjo	%	Horro	%	Rare	%	Total	%
Yes	26	81.25	16	88.89	27	100	69	89.61
No	6	18.75	2	11.11	0	0	8	10.39
Total	32		18		27		77	

Key: Arjo-represent Jimma Arjo district and Rare represent Jimma Rare district

Table 24. Matrix ranking of preferred features of improved potato variety

Features	Districts						
	Arjo	%	Horro	%	Rare	%	Total
Better taste	15	48.39	10	55.56	4	13.79	29
Big tuber	7	22.58	4	22.22	10	34.48	21
Similar to local	1	3.23	0	0.00	1	3.45	2
Better taste and big tuber	8	25.81	4	22.22	14	48.28	26
Total	31		18		29		78

Key: Arjo-represent Jimma Arjo district and Rare represent Jimma Rare district

9. CONCLUSION AND RECOMMENDATION

Among the many roles of farmers, farm activities are the major labour demanding in case of Ethiopia. Farm activities usually done by various group of peoples in a household; however, the description of the role of various gender groups is missing in most research and development programs of Ethiopia. This hindered the effort to make it so improved that the contribution of the major group be scaled up.

The study identified that many stereotypes exist concerning the gender division of labour in Ethiopian agriculture. A prominent one portrays men after farming wander around the village or to the near by town drinking alcohol leaving all field and household activities to women and children. Especially, some men abandoned farm activities to casual labourer, women, girls and boys. However, gender division of labour has dynamic feature, which changes over time with production system, wealth status and level of education.

The study depicted that men have the chief responsibilities for plowing and harvesting of cereals while women are essentially responsible for weeding and harvesting of crops like potato and beans. On the other hand, the production and management of some crops totally belong to women's domain; these are sweet potato, potato, onion, garlic and fenugreek. The experience of women and men differ, based as they are, on their respective responsibilities. Therefore, to use differential indigenous technical

knowledge of gender, its knowledge awareness and empowerment is vital.

The contribution of women in undertaking agricultural activities in general and potato production, marketing and utilization in particular is high. However, the decision of how much to produce, where and when to produce and the amount of the produce to be sold is given by men in most of the cases. The knowledge of gender is an important aspect of the farm technology problem (non-adoption, slow adoption or partial adoption and low utilization). It is vital to recognize the appropriate client for any development interventions. Technology transfer is often hindered when intra household dynamics are not taken into account. As was observed from this study, in many cases women provide the additional labour required for successful technology uptake and particularly lion's share of labour for potato production and hence facilitate technology transfer. If given chance, they are also involved in decision making process whether to adopt the proposed new technology or not. This is usually based on their evaluation for its contribution to food security, nutrition, income and/or on their ability to serve in provision of the required labour to implement. Therefore, failures to understand these factors could be fatal to efforts at introducing new technologies and development projects.

Men involve in numerous social and political affaires better than women. They decide on the development of their household and community with out any input of women's idea. Asset ownership solely belongs to the men, the head of the family in majority of

cases. They sell the produce and own livestock, and save the money in their pocket to satisfy their daily need. This justifies the notion of gender discrimination/domination. But because of cultural stereotypes, women themselves accepted the domination and have given up the leadership role as chief responsibility to men. Therefore, unless women are empowered and the men themselves realize the longstanding culture that affect relation between men and women, the women can not develop the notion of gender equity; they have no reason to worry. Female self-employment is especially encouraged because higher incomes for women empower them, improve the health of their families, and alleviate poverty in society at large.

The study also depicted that environmental degradation and poor economic development have more negative impact on women, children and poor households. This is because women and children directly involve in fuel wood and water collection. As well the survival of poor households mainly depend on sales of fuel wood and fetch of water. Women in poor household families involve in all household chores, besides they are breadwinners. Therefore, environmental degradation and economic pressure exacerbated women's workload.

In overall, women do not exercise equal right as that of men. Most farm households do not have good knowledge and skills about gender relationships and its impact on development. Different sectors, which work directly or indirectly with farm households, do not have program related to gender. Therefore, there is a demand

of positive transformation to bring women with equitable opportunities. Hence, there should be well-designed policy and strategy that appreciate equitable gender relations and local level consciousness rising.

Generally, this study revealed that there is no gender equity and equality between men and women in the study areas. This has been attributed to the negative impacts of culture, religion and traditionally accepted social norms that put many burdens on women shoulder without or with very little benefits from the achievements.

10. REFERENCE

- Almaz Eshete, 2000. Why is Gender a Development Issue? Pp 37-45. In: Institutionalizing Gender Planning in Agricultural Technology Generation and Transfer Processes. EARO, Addis Ababa.
- CTA. 1999. The Role of Smallholder Farmers in Seed Production Systems. Report and Recommendations of Study Visit to Zimbabwe, 15-16 February 1999. Syce publishing, London, United Kingdom.
- Dessalegn Rahmato. 1991. Rural women in Ethiopia: problems and prospects. Pp. 31-45. In: Gender Issues in Ethiopia. T Berhane-Selassie (ed.). Institute of Ethiopian Studies, Addis Ababa University, Addis Ababa.
- Dessalegn Rahmato. 2003. Resettlement in Ethiopia: the tragedy of population relocation in 1980s. Forum for Social Studies, Addis Ababa, Ethiopia. 75 p.
- FARM Africa. 1992a. Report of a diagnostic survey: Zenga Awande Peasants Association in Zenti Awraja. FARM Africa, Addis Ababa.
- FARM Africa. 1992b. Report of a diagnostic survey: Hanaze Peasants Association. FARM Africa, Addis Ababa.
- Feldstein, H and Poats, S (eds.). 1989. Working Together: Gender Analysis in Agriculture Vol I and II. Kumarian Press, West Hartford, CN.
- Ferguson, A, Horn, N. 1985. Situating Agricultural Research: class and gender issues in project advisement. Pp. 85-90. In:

Women Creating Wealth: Transforming Economic Development.

- Franzel, S. and H.V. Houten. (eds.). 1992. Research with farmers lessons from Ethiopia. Institute of Agricultural Research, Addis Ababa. 290p.
- Flintain, F. 2003. 'Engendering' Eden: Women, Gender and ICDPs: Lessons Learnt and Ways Forward. Summary Document. Wild Life and Development Serious No. 16. International Institute for Environment and Development, London.
- Girma Abera, Mathewos Belisa, Shmelis Dejene, Hailu Gudata and Gebremedhin W/Giories. 2004. Enhancing Food Security Through Farmer Based Seed System, the Case of Improved Potato Production Technology Transfer in Western Ethiopia. Research Report. Oromia Agricultural Research Institute. Bako Agricultural Research Center, Oromia, Ethiopia.
- Juma Ealestus and Ojwang J.B. 1996. In Land We Trust Environment, Private Property and Constitutional Change. Pp. 61-62. Imtiatues Publishers, Nairobi, Kenya.
- Milton Obote, 2000. Basis of Gender and Gender Analysis. Pp 46-54. In: Institutionalizing Gender Planning in Agricultural Technology Generation and Transfer Processes. EARO, Addis Ababa.
- OSSREA. 2003. Navigating Gender. In: OSSREA handout provided during the Research Methodology Training in Gender and social Analysis in Natural Resource Management Research Held in Addis Ababa. November 24 to December 6, 2003.

- Poats, S., Schmink, M and Spring, A. (eds.). 1988. Gender Issue in Farming Systems Research and Extension. West view Press, Boulder, CO.
- Sandford, J., Kassa, H. 1993. The effect of gender on resource contribution, decision making and influence: A comparison between enset, tef and maize. Pp 164-171. In: Enset-Based Sustainable Agriculture in Ethiopia (Tsedeke A, Hiebsch C, Brandt S.A and Seifu G Editors). 13-20 December 1993, Institute of Agricultural Research. Addis Ababa, Ethiopia.
- Scoones, I. and Thompson, J. 1994. Beyond Farmer First. Rural People's Knowledge, Agricultural research and extension practice. International Institute for Environment and Development. International Technology Publications Ltd 103-105 Southampton Row, London WC 1B 4HH, UK.
- Spring, A. 1994. Agricultural Development and Gender Issues in Malawi. University Press of America, Landham, MD.
- Regers, B. 1980. The Domestication of Women: Discrimination in Developing Societies. New York: St Martins Press.
- Wiedemann, J. 1987. Designing Agricultural Extension for women farmers in developing countries. In: Agricultural Extension Worldwide. W Rivera, S Schram (ed.). Croom Helm, London.
- Yeshe Chiche, 2000. Strategy to Institutionalize Gender Planning in Agricultural Technology Generation and Transfer Processes: *Draft Proposal*. Pp 15-158. In: Institutionalizing Gender Planning in Agricultural Technology Generation and Transfer Processes. EARO, Addis Ababa.

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