

**School of Graduate Studies
Addis Ababa University**

**Changes in the Production Practices of the
Ari People, Southwestern Ethiopia**

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**July, 2009
Addis Ababa University**

Changes in the Production Practices of the Ari People, Southwestern Ethiopia

APPROVED BY THE BOARD OF STUDIES
A Thesis Presented to the School of Graduate Studies of the Addis
Ababa University

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In Partial Fulfillment of the Requirements for the Degree of Master of Arts
in Social Anthropology

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July, 2009
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Acknowledgment

My advisor, Dr Gebre Yntiso, deserves infinite appreciation and I owe him every respect. With out his constructive comments and timely feed back this research would have been impossible. I would like to thank him for he has made unreserved help in repeatedly reading and genuinely correcting this research paper beginning from its raw stage. Moreover, his moral, finical and material supports were the sources of encouragement to the successful achievement of my research journey.

Dr Woldeamalak Bewket has made unreserved effort to make this research work valuable. Much of the work in relation to the climate data in this research was done under his counsel. His academic contributions to this research were immense.

This research was financially supported by Masayoshi Shigeta (Professor) of Kyoto University whom I have to thank from the bottom of my heart.

Tariku Dejene is the one I always grant a place in my life time reserved for genuine friends. He is the one who did much to the success of this research specially the once related to the analysis of the survey.

Getnet Kebede: a friend in need is a friend indeed. Your effort in assisting me the way I should use the metreology data and your actual involvement during the analysis were helpful to enhance the quality of my work. Thank You.

Hika Fekede, Berehanu Megerssa, Brehane Mezghebo, Salahadin Eshetu, and Solomon Akele were my true friends whom I have to thank with the possible reach of my words for their huge contribution to the success of my study. They have made proof readings, provided me with reading materials and above all encouraged me throughout the research process.

Tibebu Kebede and his beloved wife Meskerem Abera were always in my side. They have made unreserved moral and financial support. I would like to underline the recognition I have given them already.

I have to admire my mom and dad, also my brothers and sisters, whose encouragements and love has been a corner stone of my success not only to this research but in every walks of my life. My father who has devoted his life time to care for his children deserve every honor a son can bring to his father.

Finally, the people of Ari at Akamer, Mester, and Arkinti whose affection and kindness during my field stay helped me to feel at home has to be sincerely acknowledged.

Acronyms and Abbreviations

- **FMR:** Forced Migration Review
- **GEP:** Green Forum Proceedings
- **NRC:** National Research Council
- **NAIA:** National Agricultural Inputs Authority
- **CSA:** Central Statistics Authority
- **OECD:** Organization for Economic Co-operation and Development
- **NGO:** Non-Governmental Organization
- **FAO:** Food and Agriculture Organization (UN)
- **NMSA:** National Metrological Services Agency
- **ETB:** Ethiopian Currency (Money)

Glossary

- Araf** The Ari language
- Aqim** Ensete
- Ashin** Dry season
- Baabi** Local chief
- Bergi** Summer Rainy Season
- Boira** Traditional Ari digging sticks made up of wood and iron
- Buk** Traditional Ari song
- Buna** Coffee
- Chilshi** Ritual performed for rainmaking
- Dawla** Lowland
- Dizi** Highland
- Durka** Ensete disease
- Ensete** A root crop widely grown in southwestern Ethiopia
- Fatri** Maize
- Feket** Numerous, tiny and destructive birds
- Gachi** Tef
- Godmi** Ritual specialist
- Gola** Local beer
- Gosha** A digging tool made up of wood and iron
- Gosi** Barely
- Kororima** Cardamon
- Mossa** Cooked ensete
- Rubi** Sorghum
- Ringa** Pea
- Sida** One among the various territories in Ari ruled by local chiefs
- Sora** Traditional Ari mate selection and marriage arrangement

List of Tables, Figures and Plates

Tika Root crops and vegetables

Tikam A garden in the backyard on which root crops are planted

Timad Traditional land measurement scale. One 'timad' is equivalent to 0.25 hectare.

Wali Agricultural tool made up of wood and iron usually used during weeding

Washi A kind of bread made up of ensete

Wonam A farm-field on which cereals are grown

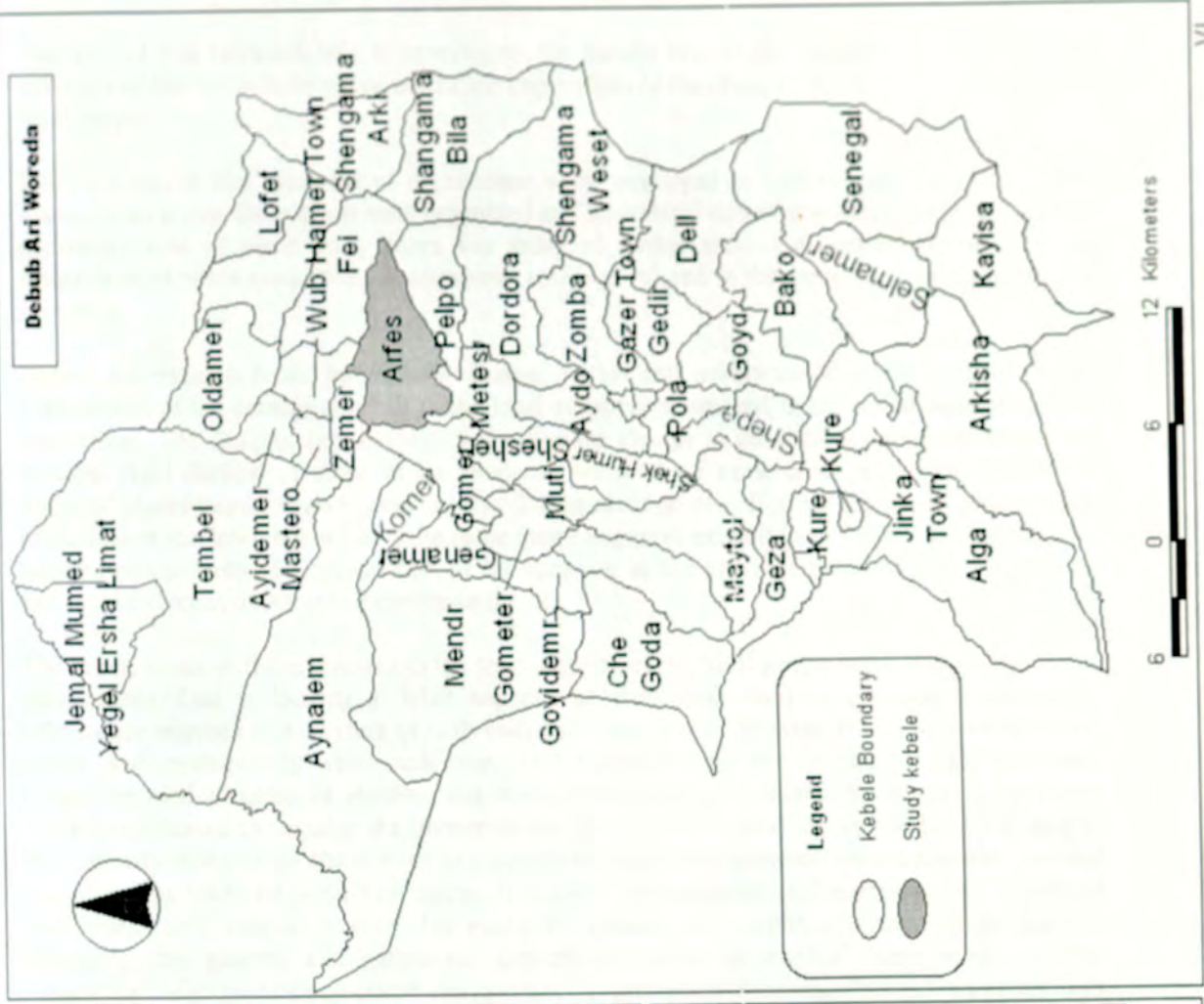
Wooka Bean

Zergi wheat

Zuni Boiled ensete

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Abstract

The aim of this research was to investigate the factors behind the changes in the production practices of the Ari people and to assess the implication of the changes for the food security of the local people.

Both qualitative and quantitative approaches were employed to collect data. Interviews were made, focus group discussions were organized and household survey was conducted. Moreover, a metrology data of some thirty years was analyzed. Other secondary sources pertinent to the research work were consulted. Professional readings related to the topic were investigated and reviewed.

Hence, the research found out climate change, market and infrastructure development to be the main driver of the change resulted in the kind of crops grown and in the actual motives behind production. The shifting agro-ecology following the change in the local weather conditions has brought yield decline of crops in the lowlands while those same crops when they expand to highland places begun to give good harvest. The production of coffee, sorghum, and maize begun to decline in the lowlands while these same crops begun to expand in to the highland areas with boosted productivity. The production of tef common in the previous times both in the lowland and highland areas of Ari was exterminated.

The implications of these changes to the food security of the local people were seen from various perspectives. One is looking at what happens as crop production switch from a previously subsistence oriented to a mixture of both cash and subsistence. As crops begun to dominate food grains, and consequently when cash crops exclusively become the domain of male household heads, the food situation of children and women worsened. The nutritional status of each crop was also evaluated as to judge the impact of the change for the food security of the local people. The capacity of the crops themselves in adapting to harsh environmental conditions was seen and judgment was made on what will happen if a given crop expands or disappears. The household food entitlement situations were also evaluated against the commercialization of production. Generally, the genetic and agronomic aspects of "crops in exodus" were explored. The "migration" of crops and associated changes were expressed by the researcher as "mounting" and "diminishing" to refer to the expansion of crops from lowland to highland places in the former case and the decline or extermination of various crops in the later case. Beside the three major factors responsible to have caused the changes, various limiting factors of production were also identified. Inadequate extension services, population pressure, lack of agricultural inputs supply, plant diseases and pests, lack of draught animal, absence of financial provisions, shortage of grazing and farm lands were some of the constraints to the Ari agriculture.

The research, hence, suggested policy priority areas after listed down the major constraints in the Ari production practices. Scientific research should be encouraged to better understand the environmental, genetic and agronomic and cultural aspects of production in the area. Extension priority areas such as the provision of improved agricultural technologies; improved seed, fertilizers, pesticides etc are needed. Moreover, administrative and regulatory measures need to be taken to further the positive impact already brought by the development of market and infrastructure in the area. Beside the need to take mitigation measures to lessen the impact of climate change in the long run, short term weather forecast services will be helpful to farmers hovering between hope and fear.

Chapter One: Introduction

In most poor countries, agriculture is a major employer and source of national income and export earnings. Whatever happens to this sector is therefore, will have considerable impact on the poor people living in rural areas. If the sector is improved, it means an improvement in the lives of the poor, but, when it is risked, then, with it the welfare of destitute.

For agriculture sector to achieve its potential; investment in infrastructure, provision of improved agricultural technologies, improved market accesses, transportation services, rural education and health services, and timely and appropriate information on weather are needed. Moreover, the natural resource bases of the people need to be appropriately managed and protected from abuse.

The Ari people practice crop production with animal husbandry as a means of their livelihood. At various altitudes, the people grow different types of crops. The three major agro-ecological zones of hot lowlands (dawla), moderate midland and cold highlands (dizi) have been responsible for the adoption of the various production practices.

At present, their production practices have undergone significant changes in the actual crops grown, the elevations to which these crops were grown and people's motives behind production in general. Behind the changes in the Ari production practices, multiple yet interrelated factors were identified.

Two major changes have been observed: the expansion of crops to highland areas and the declining of crops grown before at various elevations. These were changes occurred exclusively in the crop production practices alone. In chapter three and four of this research work, the two major changes are discussed and their complexities revealed. Moreover, the major motives and encouragements behind these changes are provided. For convenience, the researcher has delineated the two major issues and has labeled crops whose production is either declining or disappearing as "*Diminishing Crops*" and those whose introduction to the area is a recent phenomenon as "*Mounting Crops*".

1.1. Statement of the Problem

The Ari, sedentary agriculturalists in tropical Africa, are one of the peoples of today's southwestern Ethiopia. According to Gebre (1995:2), who studied the production practices of the Ari people, "the production of food crops has been declining in favor of the production of cash crops." The author noted that the reasons behind and the implications for the overall changes in the production practices in general and in food security in particular need to be investigated.

The present study reveals that the level of production of food crops such as ensete, tef and sorghum has been declining. At the same time, new crops such as maize, coffee and cradmon have been introduced to highland areas where they have not been grown before. Shigeta (1991) stated that, the Ari- ensete relationship is beyond subsistence. Therefore, the decline of ensete production has economic implications and sociocultural consequences. It is not clear whether these changes were due to climate change, economic reasons or other factors. The implication of the change for food security of the local people remained unknown.

The present research reveals that, except for three households out of the sampled sixty, most households have given up the production of tef. On the other hand, the majority of the households surveyed reported to have begun growing maize and coffee in the last nine years. A significant number of them had begun growing cradmon as well. This research therefore, explored the factors responsible for the recent changes in the production strategy of the Ari people and the implication of the changes for the food security of the local people.

1.2. Objectives of the Study

Generally, this research is aimed at exploring the overall change in production strategy of the Ari people

Specifically, the focus of the study was:

- i) to identify the major factors behind the change in production practices
- ii) to assess the implication of the changes for food security of the local people

1.3. Significance of the study

The study has found out that weather variability, better market access and improved transportation were the major factors behind the changes in the crop production practices of the Ari people. The unreliability of the rainfall patterns and the ever increasing temperature of the area has disturbed crop production practices of the Ari, which was formerly cereal dominated. Crops such as sorghum, maize, peas, beans, tef, wheat and barely were seriously affected by the abnormal weather circumstances. As the temperature increases and rainfall becomes erratic, the formerly very cold highlands were turned into moderate temperature; while the formerly midland areas with moderate temperature have become a hot place. As stated by Ashley (1999), in *"Food Crops and Drought"*, this type of change is the consequence of global warming and it usually allows farmers to grow new types of crops to very cold areas that they have never been grown before. "One consequence of global warming is that climatic zones may shift by hundreds of kilometers of latitude, and hundreds of meters in altitude" (Ashley, 1999:10) Ashley further argued if the global trend continues as it used to be in the past, in the future it will allow farmers to grow wheat in the currently very cold places of the United States, Canada and Europe, which for the time being are very cold places. The research, hence, identified the major factor to be the ever changing weather in the area.

Discouraged by repeated crop failures and at the same time encouraged by the price of cash crops on the local market and associated improvements in the transportation sector, the farmers in the study area have changed their production practices from cereal dominated to mixture of both cash and cereal. The high price of coffee and cradmon in the local market has encouraged farmers to expand the production of these crops on their respective farmlands. The newly constructed road which connects Jinka-Gazer-Mester-Tolta has played a considerable role in connecting the rural farmers with urban markets and traders. Consequently, crops such as coffee, cradmon and maize were expanding in to the highlands where they have never grown before. Conversely, crops such as tef, ensete and sorghum were declining in yield in the lowland and midland areas. Tef was exceptionally exterminated from the production practices of the Ari in less than a decade.

Both the declining scenario in food grains and the increasing trend in the volume of cash crops have gradually put the conditions of food security at risk. The declining of yield of major food grains and repeated failures of these crops have caused shortage of grain supply both in the households and at the local market. The changing weather was responsible for the crop failures; while the decline in yield beside the changing weather was caused by the small land devoted to grains, as cash crops continue to expand. Though cash crop continues to receive high demand on the market, it does not seem to support household members on equitable basis. This change, especially the commercialization of production in the area, has altered the consumption patterns and food entitlement situations of households. Within the households, as indicated by farmers during focus group discussions and interviews, the situation of children and women is worsening as the production ever becomes cash and the control and management over cash continue to be a privilege of men household heads. At times of food shortages, hence, since most of the cash is consumed by the household heads during market days for their amusement, children and their mothers usually pay the price of starvation. The over all production and supply of grain on the market was also reduced as cash crops were gradually dominating farmlands where food grains were formerly grown.

The above findings of this research could be used for various purposes by individual researchers and institutions. Since this research has brought the local level knowledge of the consequences of changing livelihoods and indigenous adaptation strategies employed by the people, it will contribute to the existing endeavor of understanding societies' adaptive strategies in a changing scenario. The food crops most deserving attention are likely to have been mentioned throughout this research work. Advantages and disadvantages of crops from genetic to agronomic point of view are discussed. The market dimension of crops in the area is also revealed. The major production limitations of the area are summarized. And hence, a policy gaps and options can be drawn based on the aforementioned findings in order to change the lives of Ari farmers on sustainable basis from production, consumption, and marketing and environment perspectives. Thus, institutions working in the area of implementing and formulating rural food security strategy and those engaged in environmental protection activities could highly benefit in getting knowledge from the people's own perspectives.

Beside its contribution to serving policy-makers in their effort to formulate appropriate policy alternatives through providing specific ecological, economic and societal change characteristics of Ari, it would bring to the academia the local level society-nature interaction of the Ari and perhaps stimulate further detailed study in the area.

1.4. Data Sources and Collection Methods

Based on the objectives of this research, various methods of data collection were chosen. The choice of the data gathering techniques considered issues such as cost and time available for the research, the depth and breadth of the data required. Consequently, both qualitative and quantitative data gathering techniques were employed and both primary and secondary sources of information were consulted.

As per the objectives of the research which aimed at studying the major factors behind the changes in the production practices of the Ari and socio-economic and cultural consequences associated with the change, a wide variety of information was gathered. For instance, the types of crops newly introduced to the area, the status of old crops grown in the area as new crops spread into their territories, the major causes of the changes, implications of the changes for the food security of the local people, the household level impact of the change and entitlement situation within the households were some of the information collected using qualitative and quantitative approaches.

Sampled household heads, agricultural extension workers, coffee growers, ritual specialists, local chiefs, community elders, Gazer Woreda Agriculture and Rural Development Bureau workers and the various segments of the community were involved in providing primary information to the research.

The secondary data sources were the very few yet available readings on Ari written by different authors, the various books, articles and research works related to production practices, climate change, market and production, farm extension services, rural infrastructure, rural financing etc as they were available in the libraries, bookshops and online readings. Moreover, statistical evidences from The Ethiopian Statistical Authority (ESA 2007), meteorological data by Ethiopian Metrological Services Agency (EMSA), National Crop Production Survey Documents and National Crop Variety Register Documents were all used to aid the research work.

Various techniques and instruments were employed in gathering information from the primary sources of data mentioned above. Below, they are described one by one.

1.4.1. Interviews

Interviews were employed to deeply explore issues relevant to the research topic from key informants and appropriate experts in the area. An interview guideline (guiding question) was prepared with the consideration of the research questions in general and the objective of the research in particular. Agriculture experts in the area were interviewed to enrich the research work with their perspectives and professional comments relevant to the research topic. Using the interview, the various extension efforts made by the Agriculture and Rural Development Bureau were identified and if those extension services provided to farmers might have necessitated the changes in the production practices of the Ari were judged. Key informants and knowledgeable individuals were consulted based on their acquaintances to a particular place, issue and event. Moreover, interviews were conducted with individual farmers in order to learn their personal experiences and strategies regarding crop production. It was through this method that the individual household level food security situation was studied. Formal interviews were made to exchange views with individual farmers on their personal production strategies and on the account of their own real life situations related to production such as crop failure incidents, reasons for growing a particular type of crop, what forced them to grow new crops that they have never produced before, their household food security situation before and after the introduction of new crops etc.

To assess the conditions of food security at the household level and also grasp the general economic wellbeing of households, their crop production decisions, years in which they begun growing new crops etc, questionnaire was designed and filled by household heads through an interview conducted by enumerators. Both open and closed ended questions were included in the questionnaire. Five enumerators were selected among the local school teachers and sixty household heads were interviewed under the supervision of the researcher.

Key informants were chosen based on their exceptional knowledge concerning a particular issue relevant to the research. Ritual specialists and local chiefs were selected because of their unique place in the community, which they don't share it with other ordinary people. Woreda agriculture and rural development experts and also extension workers were selected as key informants because of their professional involvement in the production practices of the people. Because of their maturity and possession of past history, community elders and senior citizens were also interviewed. Hence, two religious specialists (Godimi), chief of the land of Sida (Baabi), two community elders, two experts from the Agriculture and Rural Development Bureau, three extensions workers (DAs); totally ten people were chosen as key informants.

1.4.2. Focused Group Discussions

This method was employed primarily to triangulate information gathered through other methods such as interview and questionnaires. Focused group discussions were organized in an informal setting, where group interaction among participants was able to build on ideas raised by individuals at the spot and also on information received through other techniques. Confusions were refined and contradictions were crosschecked during hot discussions among participants. Agreements and disagreements during focused group discussions among participants on particular issues such as on the causes of the changes in the production practices were helpful to crosscheck with the information received through other sources.

Totally four focused group discussions were conducted. Each group discussions were facilitated by the researcher with the help of two assistants employed to show directions, places, and people's homes and also interpret languages for the researcher.

1.4.3. Participant Observation

Observation should not be a mere type of looking at things. But, it should involve getting closer to people and their neighborhoods, making them feel comfortable with the researcher's presence; and making sure that they are free from any kind of harm they might face in giving information. This is what the researcher had actually followed to this particular end; living with them for a moderately sufficient duration of time.

This method was seen by the researcher as a main source of successful field stay. The researcher was accepted, and hence developed trust by the level of his participation in the daily routines of the local people such as eating what they eat, going to the river with them, taking part in coffee harvesting, accompanying them at market places, be with them during festivals such as epiphany, attending their amusement moments at the local drink (tej) shops, etc.

The researcher's movements from place to place throughout the village during field stay was an aid to observing such things as daily activities of individuals, settlement patterns, farm land management conditions, the kind of technology, crop types and their cropping patterns, individuals role in the daily activities of the people, etc.

1.4.4. Audio Tape Recording and Photographing

Recording people's discussion both during focused group discussions and interviews with key informants was employed. It was valuable in retrieving information and refreshing, memory during data analysis. Recorded evidences are always useful for researchers especially, for those getting back to the people for verification is costly. Sixteen audio cassettes were employed and later the voices were transcribed both during the field stay and also right after the field visit. The case stories presented in the research work were obtained from transcription of the audio files.

Photographing, as a tool for data collection was used to assist the researcher's sense of perceptions. It has enriched the research with reliable observation since it records faithfully what the human eye can not see and also retains information for evidence refinement. "The camera sees differently than does the human eye. When our photographs are printed, we see not only what were culturally conditioned to see in the fraction of a second when the picture was taken, but also the totality of social interaction and material culture that was present within the scope of the camera's lens" (Crane and Angrosino, 1984:167) More importantly, photographs can supplement visually what is usually difficult to present in any other form; though difficult to interpret them alone out of context. The photographs presented throughout this research paper witness this fact.

1.4.5. Sampling

The list of total population of the households in the study area obtained from the local kebele administration was three hundred. The researcher decided to study 20% of the population. The decision was made primarily based on the homogeneity of the population realized during qualitative studies such as interviews, observations and focus group discussions. Again budgetary and time constraints were also considered in deciding what portion of the population to study. Systematic random sampling was used to identify the sixty respondents. The population was first divided by the sample size to get the interval for choosing the sample population. Then, a number was randomly selected between zero and ten to start the selection. Every 5th household was selected until the desired numbers (60 households) were obtained.

1.5. Data Analysis

The data from the household survey was analyzed keeping in mind the pertinent issues to be investigated as per the objectives of this research and issues such as households' decision to grow a particular crop, factors responsible for the changes in the production of crops, years in which the changes took place, opinions of farmers on the possible and actual impact of the changes in the production practices for the food security of local people. Descriptive statistics has been employed to widely describe farmers' perceptions of their production practices. Consequently, averages, percentages and ratios were used to show the results. Issues such as household's farm resources, use of modern agricultural inputs, credit services, extension services, off-farm income opportunities, the role of market in their production decisions, the conditions of infrastructure, and the overall food security status were analyzed in relation to the changes observed in the production practices. The SPSS software was employed in analyzing quantitative data gathered through questionnaires and the metrological data obtained from NMSA.

Data collected through the focus group discussions and interviews was analyzed using the qualitative method such as case stories, narratives; anecdotes, pictures etc, and yet were very useful in augmenting the analysis result of the quantitative data.

Chapter Two: Description of the Research Area and the People

2.1. Language

The Ari speak Araf, a language that belongs to the Omotic cluster. Previously, it was viewed as a language that belongs to Western Cushitic and Nilo-Saharan family by different authors at various times until recently when Fleming (1976) coined the notion of Omotic (Gebre, 1995). The language has developed into five varieties of dialects which are often regarded as independent languages from one another. While Shigeta (1991) wrote this is analogous to the five independent chiefs- "baabi" of Ari, it won't be the case since Gebre (1995) wrote there were about nine territories ruled by independent chiefs throughout the land of Ari. Eighty five percent (85%) of the vocabularies in the said dialects, however, revealed similarities and, hence, Araf a single language belongs to the entire Ari (Carolyn 1985, in Shigeta 1991).

2.2. The Physical Environment

The Ari reside in today's Southern Nations Nationalities and People's Region, in the South Omo Zone in two *woredas*, namely *Debub Ari* and *Semen Ari*. Formerly, this place was part of Geleb-Hamer district in the Gamo-Gofa province at the southern tip of the Ethiopian highlands.

The Ari are surrounded by the various ethnic groups most of which are found in the South Omo Zone. The people of Maale, Gofa, Basketa, Dime, Mursi, Kara, and Banna were bordering the Ari in different directions. With the Ari, these people have one or more of the following relations: historical, marriage, trade, linguistic, or war. Marriage and historical ties were common between the Ari specially, but, not only with Hammer, Dime, Kara and Banna. The Ari were often in conflict with the Mursi. While the Ari were sedentary agriculturalists, which badly needs their land for crop cultivation, the Mursi also look after grazing land for the livestock they own in abundance as pastoralists anywhere else. The Mursi were well armed so were the Ari of Beya territory bordering the Mursi.

The Ari territory harbors the three major climatic zones of hot lowlands, moderate midlands and very cold highlands. This was corresponding to the altitude in the area which ranges from 800m in the southern lowlands and 3375m in the northern highlands (Shigeta, 1991). Across these three altitudinal zones, different vegetation distribution and crop production practices were found. The existence of diverse agro-ecological conditions enabled the Ari farmers to grow a large variety of crops including cereals (maize, sorghum, wheat, barely tef, millet,) Pulses (horse beans, field peas) stimulants (coffee, tobacco) fruits, (banana, orange, papaya, mango, avocado, etc), root crops such as (ensete, potato, sweet-potato, yam, cassava, taro, etc).

Nevertheless, the Ari traditionally classify altitudes in two; lowland and highland. They call the highland “dizi” and the lowland “dawla” Individuals and farm products among the Ari were often identified as some one/ some thing from “dizi” and “dawla” especially at the market place. People from “dizi” were short and muscular; while those from “dawla” were usually and relatively thin and tall.

The study area of Akamer and Arkinti are found in the Debub Ari woreda nearly 27 kms away from Jinka to the west. Both sub kebeles were administered under the Arfes kebele in the Debub Ari woreda. The capital of the woreda: Gazer is situated on the same route approximately 17kms away from Jinka, which was also the capital for South Omo Zone.

2.3. Population

Referring to the census made by the CSA in 1984, Gebre (1995) wrote that the then Ari population was 109,124. Today, however, according to the (CSA, 2007) report the population of Ari reached 280,187. Compared to the 1984 census, the 2007 census shows the population of Ari increased by 171,063 persons. This demonstrates that the Ari population size increased in steady increments of significant proportion. In the same report by (CSA 2007) it is indicated that, 33,580 Ari people were urban dwellers; while it was only 929 persons living in urban areas some twenty years ago. In the past twenty years, therefore, people of Ari living in urban areas increased by 36%. In terms of ethnicity, the Ari were numerous among the sixteen ethnic groups found in South Omo.

2.4. Economy

By and large the Ari economy was predominantly subsistence agriculture characterized by crop production with marginal cattle keeping. The overwhelming majority of households were engaged in agricultural activities as their most important economic endeavor. The primary household production priority was self-sufficiency in food, and grain was only marketed after household requirements have been met. The major food crops such as maize, sorghum, barely, wheat, peas and beans were grown across the three agro-ecological zones to form crop distinctiveness at various elevations. Cereals were the major food crops both in terms of the area they were planted to and volume of production obtained. Root crops such as taro, yam, cassava and sweet potatoes were also moderately grown to support the household food consumption. Altitude determines the type and magnitude of crops grown and the agricultural calendar.

The Ari farmers were “traditional” agriculturalists whose production was restricted to subsistence. But now a day, their crop productions have become a mixture of both commercial and subsistence. In the strict sense, however, the Ari farmers were characterized by their small landholdings and “survivalist” nature of their overall economy and production strategy. Their environment is best expressed as “fragile” as the forest cover gradually eroded. They were rarely engaged in off-farm income generating activities for their livelihoods were constrained by lack of skills, know-how and financial capital. The Ari farmers were relatively permanent in their settlements and the majority of them have their farmlands no matter how that was small. Furthermore, the technologies they employ during farm activities were simple.

Though they predominantly produce for their own consumptions, market plays a significant role in the lives of Ari from earlier days until now. Since farmers in the three agro ecological zones produce crops distinctive to their settlements, market was necessary to exchange goods and products. Early form of bartering; the exchange of agricultural goods with out the use of money had been practiced between the lowlanders and highlanders. The highland farmers bring farm products such as fermented ensete, barely and wheat and the lowlanders also bring coffee, sorghum and other farm products to the market place found at the junction of these two altitudes.

Trade, however, has a meager share of their livelihood strategy. Agriculture was by far the most important sector with individual small holders as the most important production unit. Most of the households were operating farm activities based on a small amount of capital and on a very small sized cropping area. The farm household, which consists of the family head and other members, are in any case the main source of the agricultural labour force used in all farm activities. Sponsored labour party and mutual gatherings of work force were often organized to supplement the labour force at home.

Lack of education, extension services, veterinary services, financial provision services, and the ever changing climate of the area have constrained Ari farmers from producing sufficient for consumption and surplus for market.

Moreover, the contradictory agricultural strategies: increasing coffee production for cash and the need for self-sufficiency through own production actually signify the challenges which faced the Ari farmers in the allocation of inputs and use of scarce resources such as, land.

2.5. Calendar, Seasons and Months

The Ari calendar is cosmological; meaning it is lunar in which case people divide months based on the position of the moon in the blue. Therefore, a month is counted from the day the moon appears until the day the next moon is seen.

Depending on their knowledge of counting months based on the position of the moon, traditionally the Ari unlike the *"thirteen months of sunshine"* recognize twelve months of a year. Hence, the year is divided in to four seasons out of which the two are very crucial. The twelve months are namely Tama (September), Beksa (October), Somza, (November), Tora (December), Longa (January), Maken (February), Oidi (March), Dola (April), La (May), Tabza (June), Zeta (July), and Sagla (August). They are broadly categorized in to four seasons. The first from November to March is known as Ashin or the dry season. The Ari call this season, which lasts from June to August, the Bergi-summer season. The time from September to November is identified as Shukli. Woli is a season that includes the time from March to May. Ashin (winter) and Bergi (summer) are, however, the two major crop growing seasons popular among the Ari. Not every farmer knows the

existence of the four seasons. But every one can tell Bergi and Ashin as soon as asked together with their characteristics and relevance.

There were proverbs told with regard to each months of a year. In the proverbs, the characteristics of each month from weather, production, consumption and social welfare point view were described as follows. Elders reported that September is a gateway to abundance. It is a time for people to eat crops especially maize at their greener stage. During this month, the sunlight dominates the rain. Farmers usually put the beehive on trees.

October is a month in which the rain falls in moderate shower as the following Ari proverb implies: "*Beksa bezi samsade*". It is literally translated as: [In October beehives give bad odor]. The beehive which has been put on trees during September will have bad smell in October. For this reason, renewing beehives is usually done this time. This month is also a time of relative plenty. Shortage of food is not felt during this month since crops are already matured.

November is a time of harvest. People commonly sing songs of harvest. A fire smoke is released from every farmland as an indication of the beginning of crop gathering. It is a time for availability of food in abundance. November is characterized by both heavy heating of the sun and excess rainfall. The heavy rain, which penetrates through the small hut as elders commented, was not only an illustration of the actual weather but also a symbolic expression of the boys roaming around girls. In the proverb, it says, the small huts can not resist the heavy rain during this month: "*sumza anzet wodgir sorsede*" literally translated as: [while boys wander after them, in November, girls look after birds and wild animals]. It is a time for "sora"; a traditional Ari mate selection and marriage arrangement. Boys and girls during this month play a traditional Ari song; "buk"

December is a time of heavy sun heating. Since it has been raining during November, in this month the sun heating creates a bad odor of the environment: "*tora toni shokshide*" which literally means [in December the environment smell horrible], is an indication of this fact. In this month, animal dung, human excreta, and the soil together create a filthy look of the environment with ghastly smell. Moreover, the harvesting of cereals and

coffee begun in November continue in December. This month is also a time of entertainment and festivals.

A month, in which every green thing becomes dry, is January. It is the only month in which rain is absent and heavy sun heating is dominant. During this month, people burn woods, grasses and leftovers of crops over farmland. The proverb says, "*longa loka fama kale*" meaning, [In January a fire can cross a river]. It gives an idea about the declining or drying of rivers. Most of the look of the environment is exceptionally dry at this time.

February is a time when the first rain of the "*ishin*" takes place. This time, every dry plant becomes green. Bamboo, cabbages, taro, cassava etc begin to flourish. This is stated in the following Ari proverb: "*maken mati wotside*."

March is characterized by its heavy rainfall. A strong farmer, who during January and February deposited taro, will consume it since his taro could easily be cooked. But, a lazy farmer, who during those months has shown reluctance to preserve them, would not get them easily and even if he tries to dig them out from the ground, he will find a taro which as a result of the rain has formed a bud. Such a taro is difficult to cook and unpleasant to eat. The proverb reads as follows: "*arfioydi fulafulako gabzigir fulda ekako*." Taro is eaten during this time since it is a time of food shortage. This was a month in which food shortage was habitually acute among the Ari farmers.

April is a time for sowing sorghum. A sorghum sown this month gives good harvest and it usually grows tall and thin. After harvest, its dead body can be used for house construction. Also it can not be easily hit by wind. April is said to have been the best time to sow sorghum as the Ari wisdom in the proverb told with regard to April reveals. "*Dola ribi dolai (Dolise)*"; [A sorghum sown during April is strong and gives good yield].

A sorghum sown during May is weak in its appearance and poor in its yield. This is stated in the following proverb: "*arfilat ribi lankimi*." Sorghum can be sown during May, but, it is not preferable since a sorghum sown during this month usually give less yield compared to that of April. The body of the plant is also weak and easily affected by wind. This reveals farmers traditional knowledge of their environment and their livelihood strategies.

June is the beginning of summer season (bergi). It is known by heavy rain. As a result, it is difficult for people to move from place to place. It is even difficult to get out of their hut. People were usually starved even when they had the money with which to buy food grain; yet the rain does not allow them easily travel to get to the market. It is often difficult to get to a place of ensete fermentation found in the backyard. Ensete need repeated process of mixing and changing a place of fermentation from one hole to the other. This, however, is not possible because the rain during this time does not allow people to move.

There are two proverbs told with regard to July. They are, "*zetat kumla afkit zepi*" and "*zetat woisink mayn zerma*". Their interpretations are: [Bean sown during July gives good yield] and [During July women get relief] respectively. July is, therefore, a month usually preferred for sowing bean in the highlands. It is known by heavy rain. A bean sown during this month gives good yield and its seeds are also big. Among the Ari, if a woman wanted a divorce during June, people say it is because of the food shortage at home, never because her husband is cruel. But, during July maize and other root crops will mature; and this time if a woman complained on her husband, people will listen to her. July therefore, is a month in which women get relief from worrying about shortage of food. It is the time in which they never feel ashamed of the food they serve their husbands. Unlike June, in July women are confident in the food they serve their husbands both in terms of quality and quantity.

During the month of August, if a bean is sowed it is certainly late and at times of harvest its seeds are found to be unripe and small- "*seglat kumilin afi saytsa*". Farmers say this was true for other crops as well. If a crop was sown during August, it is already late.

2.6. Social Institutions and Labour Organizations

Traditionally, the Ari land is territorially divided and the people categorized based on clan (toidi) which follows patrilineal lines. The various clans of the Ari were listed in the study conducted by Gebre (1995). The people were further divided in to castes (Shigeta, 1991).

Normally, the Ari land is divided into independent territories ruled by an autonomous ritual chief-baabi. According to Shigeta (1991), there were five such territories throughout Ari. Gebre (1995) however, identified and mentioned nine such territories; each of which was ruled by their respective baabi.

The power structure across these independent territories throughout the land of Ari entails the baabi at the top of the social structure followed by various Godmis-ritual specialists, Zis-community/village advisors, and Tsoiki (information agents) on the same status. The Keisi-the common people were always at the bottom of the social fabric as it may be the case everywhere.

2.6.1. The Baabi Institution

You tried to kill me in order to become the ritual king. You were supposed to succeed to the kinship only when I die of natural causes. As a punishment for your attempt to kill me, I curse the country: after my death, crops will not grow and livestock will not reproduce. In the past, I used to ward off invading forces by sending them elephant tusks as tribute. After my death, the door will be open for the butterflies and wasps. (In Alexander Naty, 1994)

The “baabi”, literally means lord of the land of Ari, is a hereditary power to rule over the land and its inhabitants. A “baabi” rules throughout his life time. His rule is absolute. The “baabi” works with other organs such as “godmi”, “zis”, “tsoyki”, and “keysi”, for the peace, stability, security and fertility of the land and its inhabitants. The “baabi” is, therefore, the highest spiritual and legislative body in the land of Ari. He assumes judicial, economic, religious and military power over his respective territory and the people within. The power is usually transferred from one person to the other through inheritance within a certain clan. The inheritance took place only when the existing “baabi” died of natural causes. And hence, among the Ari murder, and conspiracy of any sort to overthrow the baabi is improper.

It is said that, every individual, as far as he is from the recognized clan and able to fulfill the requirements could succeed to the power whenever the “baabi” over the throne is dead. But, actually and often the power is transferred from the deceased “baabi” to his elder son.

On the day of the funeral ceremony of the deceased "baabi", every village and neighborhoods gather at the ancestral shrine where the sacred stone of power transfer is found. This is where the "baabi" lives. To this place, on the day of the burial ceremony, people from every village elect and bring with them a person to succeed the "baabi."

There is one common way of assuming power-that is through inheritance, which usually takes place between the "baabi" and own son. It is a tradition, however, for villagers to come with their own representatives. On the day of power transfer, two things may be done in order to decide who the person might be. One is the negotiation which takes place among village elders and when this fails is the battle between villagers in order to help their own representative climb on the sacred stone by force. This usually follows when the elders fail to agree on the merits of the individual candidates each village have proposed. During the fight, people from each village throw stones to each other or use spears to defeat one another until one among the eligible candidates succeed to climb on the sacred stone of power transfer. Once a candidate wins to climb on the stone that would be an end to throwing stones and using whatever equipment is meant for fight. The moment he climbed on the sacred stone, he is the man-the "baabi." It would signify an end to fight and a start for celebration. In the middle of the fight people may be gravely injured or even die. Gebre (1995) stated that, during the period 1987/88 the late, "baabi" Bamay assumed power through fighting which was resulted in an injury and death of people.

The current researcher, however, identified the present "baabi" Frew was elected peacefully following a negotiation made between village elders. According to informants Seqsi Gara and Yijais Geni, Frew Bamay (the current baabi) was elected based on his education and at the same time because he was the elder son of the diseased "baabi" Bamay Garababs.

The sacred places in the "baabi" homestead are found in the remnants of aged giant trees of the early dense forest demolished. In this compound, places where the diseased "baabi" is buried, the "godmi" annual assembly, the sacred stones of power inheritance and public Gathering Square are found. A stone at the main get forms a dual get to the "baabi" compound which is believed to have mystical power to identify the guilty from

the innocent, and also places of grain reserve as it is believed that unless each genetic wealth of crops are reserved crops could not give good yield and famine may happen, are all places enclosed in the “baabi” homestead found by the hill side of Northern Mester at the place called Arki. This was regarded the shrine of the “baabi” of Sida and does not apply to other territories of Ari.

Plate 1: Baabi Frew Bamay Seated over the sacred stone of power transfer in the compound of baai shrine at Arki



Photo By: The Researcher (January, 2009)

2.6.2. The Godmi Institution

In the context of Ethiopian culture, famine is not a natural calamity, nor does it have anything to do with society and its political and socio-economic system. Famine is an act of God...famine is simply the price of sin and the victims accept it as such...no human being or human institution can be held responsible for it., (Mesfen Woldemariam 1984 cited in the Green forum proceedings No2, 2008)

Traditionally, the Ari believes that the weather changes and destroy them whenever they stop presenting gifts to the “godmi”. The “godmi” is a belief system where by the Ari trust in the divine order of the weather and protection of crops, animals and people. Both the sun and the rain are believed to be ordered by the religious specialist with a divine power. It is believed that this divine power is given to a man from certain clan. And throughout his life time until the day of his death, this religious specialist-“godmi” performs several rituals related to rainmaking.

The people of Ari believe that multiple “godmis” protect their wellbeing from evils, dangers and uncertainties. They believe in a “godmi” in charge of the sun and the rain, a “godmi” that protects crops, a “godmi” responsible for people’s health, a “godmi” whose presence is for the wellbeing of their cattle etc. The Ari depend in all these and offer them gifts.

For instance, they believe in the “godmi” of sun and the rain in its ability to order a rain of fertility and a sun of harvest. It is when they present sacrifices that the “godmi” prayers begun; and after that when the “godmi” formally begin to work on their respective land that the people will go to working their own. If the rain is needed, the people through their representatives/community advisors will present the case to the chief-“baabi” of the land and the “baabi” after hearing to peoples’ request; will send delegates to the concerned “godmi”. The delegates discuss the matter with the “godmi” and the “godmi” responds in which case he often asks for gifts/sacrifice. The sacrifice is usually a black or white sheep with coffee seeds depending on the context. If what is needed is rain, the people have to present a black sheep with coffee seeds and when sunlight is required, white sheep with coffee seeds is sacrificed.

Whenever there is rain but sunlight is needed, the same process is followed and the “godmi” this time request for a white sheep and a coffee seed. The black sheep

symbolizes rain and the white sheep represents sunlight, but, the coffee seed represents their wish to having fertility in both cases. It is after the people brought the sacrifice that the "godmi" executes the ritual called "chilshi" at the place of "chilshi", which is usually a protected forest for this particular purpose. At the place of "chilshi", the "godmi" and other ritual specialists perform the prayer and present the gift.

Before the "godmi" prayer is made at the place of chilshi, "tsoysi" is usually set. "Tsoysi" is a process of demarcation in the forest so that people should not enter for whatever purpose to the place of "chilshi" until the end of the prayer. Thus, "tsoysi" is prepared from bamboo wood whose tip is tied with ensete leaf. Once this symbol is set, no one is allowed to enter the forest for hunting, firewood collecting or for whatever purpose. The dry ensete leaf put on the bamboo wood is called "shufa".

The "godmi" and those specialists should hide themselves and stay in a reserved place in a separate hut for at least three days before the day of "chilshi" ritual. They do this in order to maintain their purity and keep themselves from any kind of evil. During this time, they are not allowed to sleep with and even see a woman. Before they enter the separate hut in order to purify themselves and also perform the sacrifices, they call the people to a place of public gathering in front of the "chilshi" compound. They receive people's hope and desires as their own and make blessings. After that, they enter the "chilshi" place in the protected forest where sacred stones of blessing and prayer are found. Being naked, they seat over those stones and call the names of their ancestors and say, "let the lost crops regain and the run away sons and daughters of Sida return home". They weep. They pray. The prayer is usually followed by slaughtering of sheep. Those specialists will look at the abdomen of the sheep and from that, they tell the fortune of the people, the crops and the cattle. This is how the Ari, since the olden days, have been performing rituals related to weather in their crop production practices. So, the struggle for rain and sun light is deeply embedded in Ari culture; but, it is not the only source of insecurity in their lives; pests, animal disease, and wind were also long been worries of the farmers. Today, every thing has gone except the challenges; not only is the weather changing, but, together their values.

Repeated crop failures and the godmis reluctance to respond to people's request, as some farmers commented, has forced them to give-up every hope they had on their traditional institution. Consequently, most farmers in Ari have become converts of protestant religion /"Mission religion". The farmers in Akamer and Arkiniti toady have divided themselves in their religious outlooks and ideology; those who consider themselves vanguards of their old tradition and those who forward criticism towards their old tradition. The former ones say, the weather becomes harsh because of the spread of the new religion which has kept people apart from the sacrifice of "chilshi" and "godmi" belief. The second group argues that, they have been mistaken of believing in an "evil spirit", which has brought about Gods' wrath to the land of Sida. The argument doesn't seem to stop. It continues until the people believed none of them are mistaken or both are wrong.

Of course, the Ari begun to lose their unity and solidarity long ago when for the first time in their history the imperial Ethiopian troops under Menelik landed in the land of Ari in the late nineteenth century. Since then, they were abandoned to practice their traditional beliefs, access too their resources, and above all they were brought under brutal handlings of the imperial troops and landlords. Instead, they were forcefully accepted Orthodox Christianity, taken as slaves and made to pay tribute. Moreover, they were denied access to their own resources.

During the military government of the Dergue, not only the Ari traditional beliefs but also Christianity by itself with other similar religions were abandoned. Many of their traditional institutions were gradually lost during this time. The Ari traditional belief today seem reviving because of a relative autonomy of practicing once own religion and culture. As most informants have indicated, however, the Ari traditional religion is suffering in an internal exile than ever before. They say the advance of protestantinism, which is converting every one in a way they will no more trust their traditional beliefs, is responsible for causing mistrust to their tradition.

A sample of sixty households was taken and their views on the "godmi" were analyzed. Out of the sixty household heads interviewed; thirty-one individuals, which represent (52%) of the sampled population, answered they don't believe in godmi. They have

varieties of reasons for not believing in godmi from the very beginning and why they gradually stopped believing in it. Twenty six individuals (83.9%) thought that it would be a sin to believe in godmi because they are Protestants or Orthodox Christians. But the majority of them as identified during individual interviews and focused group discussions were Protestant Christians. Two (6.5%) thought that it doesn't work at all, while another two did not know how the system works. Only one individual (3.2%) said he used to believe in it but his trust on godmi gradually eroded as the "godmi" stop functioning. The rest 29 individual household heads (48%) have expressed their reliance on "godmi"

The challenge of the current situation is that, people are going apart from their own traditional values where there seems no alternative. No individual or institution is there to supply them with timely weather forecast if they have to completely stop their traditional rituals regarding weather. The Ari are still "traditional", but, by the amount of new ideas and beliefs entering the community, their social relations and traditional values are crumbling. It is bringing socialization crisis as it is creating disequilibrium between generations through bringing disrespect for traditional ritual mechanisms. Ari are in confusion about their unifying values, the older generation seems to lose its normative authority, and rituals and social norms losing much of their ordering force; where education and other development interventions are inadequate to fill the gap.

Plate 2: Right: at the middle Godmi Amenack Bocho (Godmi for rain and sunlight) , Left : Godmi

Dakimas Anigir (Godmi for Crops)



Photo by: The Researcher (January, 2009)

2.6.3. Labour Organizations

The existence of differential relations among members of a community, as a result of which social relations are formed, necessitates people to perform different social roles, makes the formation of social organizations inevitable. Social organizations and networks are the conservative forces behind the endurance of a society and its values. The various codes of conduct under each organs and sanctions following maladaptive behaviors are usually the conventional force that keeps society together. Though they are some times seen to act against the norms and valued practices of their own society, most individuals are adherents of the existing social order to which they are members.

Group or organizations are characterized by their systems of inclusion and exclusion for membership. Membership could be based on kinship, neighborhood, friendship, occupation religion, or sex depending on the nature of the organization. Descriptions of the following Ari labour organizations were made based on Gebre (1995).

“Aldi”

Aldi is a labour exchange practiced among the Ari from earlier days until today. It is a labour force exchange between individuals and households living close to one another.

Members of Aldi are usually young and competent individuals. A maximum of fifteen people are involved in Aldi. Aldi is organized primarily for agricultural purposes and it can be organized at every point in agricultural practices from land preparation to harvesting. It is organized on the basis of reciprocity. Households with many children at home have the likely advantage to mobilize huge workforce in return for their lending.

There is always a leader in Aldi elected from among members. The leader is known as "baabi or Aldi bab" The leader is elected based on his prior experience and by the amount of recognition he has received from the public. He is responsible for preparing work schedules, taking attendances; allot turns and resolves dispute whenever it arises between members. He is also entitled to take measure against non-conformers. People who are absent or late are punished in kind or in cash. The punishment could also be exclusion in the worst scenario. There are varieties of misconduct and deviant behavior subjected to sanction. Absence, lateness, reluctance etc are punishable. The "baabi" also judges as to what extent successful was the work force organized in helping the person to whom the work force had been mobilized. Since there is no objective measurement of the accomplishments of the work force, the "baabi's" subjective judgments are usually exposed to criticism (Gebre 1995).

"Molaa"

It is a relatively large, organized and planned cooperative action primarily for agricultural production. It is also an opportunity through which issues of group interest are discussed and social solidarity is maintained. Molaa is organized for different purposes and carried out in different occasions in the processes of crop production. To mention them, plough, weeding, harvesting, collecting and transporting of crops. It is also organized during house construction. Membership could be based on friendship, neighborhood and marriage relations.

Compared to Aldi, Molaa is a relatively large work party. The maximum number of Aldi group members is usually the least possible Molaa grouping-that is fifteen people. Unlike Aldi, which is commonly mobilized among the capable youngsters, membership in Molaa is relatively flexible. It is an imitation of the way the entire social system functions. Consequently, Molaa members could be formed from young to old and both

sexes. It is rather a complex relation fashioned among members primarily for agricultural purposes, but, often serves for socialization purposes as it imitates the whole range of societal roles.

The power structure of Molaa follows the hierarchical structure of the wider society. It involves "baabi" (leader of Molaa), "godmi" (ritual specialist), "Zis" (co-coordinator), "Keisi" (ordinary worker), "teimi" (symbolic marriage in molaa), "kie" (symbolic husband), and "ma" (symbolic wife). These are symbolic representations of how the society functions beside their practical functions in mobilizing work force through role formation. Individuals may assume different positions with corresponding roles. The "baabi" of Molaa like the "baabi", who administers the territory is elected, but, usually based on his experience as a leader. Like the case in Aldi, where the group leader arrange labour turns, maintain work conduct, resolve dispute etc; the "baabi" of Molaa also performs these and many more activities such as organizing "gola party", putting sanctions to the deviant, or negotiating labour sells for group member who have excess labour return beyond their work to be done at home.

The "baabi" has got an assistant known by "womber", who is directly responsible from small matters and acts as a "baabi" in his absence. In third category in the molaa structure are found the "zia". Since the molaa is often divided in to two major sub-groups in order to instill competitiveness and hard work sprit between groups, there are always two "zis" each representing their respective sub group-"ragid". In order to win the competition during work, the "zis" organize and lead their sub-group. The "manas" are parallel to the "zea" in the "molaa" hierarchy. They are information agents or officers. They report cases to the "baabi" and also convey messages of the "baabi" to commoners and other responsible bodies. The "godmi" is a ritual specialist acting as a real one and also people listen to him as if he is the real one. Food and drink are first served for him and blessings are made by him. The socialization and harmonization function of "molaa" is vital.

There is a person responsible to maintain peace and security among the group. This is known as "wasagasch". Being a "police officer", he has got two police men each from the two "ragid". Deviant behavior is punished, but, before that it shall be taken to the "baabi" by these people. As an imitation of how the wider community/society functions

and at the same time to make members better shoulder responsibilities, boys and girls are requested by the "baabi" to form a symbolic marriage. Those, who do not want and do not make it for reasons of age, will be represented by whoever they choose to be "fashegans". The people who can not form marriage are called "fasha" and they are represented by "fahsegans" or people who speak on behalf of the "fasha".

A "baabi" compound has to be cleaned since the members of the "molaa" are gathered there to discuss social matters and also attend for "gola party". The "shafa" is in charge of this task of cleaning the compound. At the bottom of the "molaa" structure, every ordinary member of molaa is found-they are called "keysi"-the commoners.

"Wod"

It is a relatively large cooperative action or self-help association formed primarily for agricultural activities and building houses. A special feast usually "gola"-local beer is served during work and after the work has been done. Beside being just a work situation, "wod" is also an episode where participants enjoy the drink, the food and the fun. There are also serious social matters discussed and resolved at this moment. By this, "wod" transit its basic economic nature to more social manifestations. Reconciliation is made if there is any quarrel between individuals, discussions on marriage issues, selection of middle man ship to facilitate marriage arrangements, blessing by the elderly and many other social issues are entertained. It is also an opportunity where by issues of group interest is discussed and social solidarity is maintained.

"Wod" is organized for different purposes and carried out in different occasions in the processes of crop production. To mention them, during plough, weeding, harvesting, collecting and transporting of crops. It is commonly organized during house construction. Membership could be based on friendship, neighborhood and marriage relations.

"Idir"

Unlike other places in Ethiopia, the Ari use the term "idir" as it refers to a larger self-help organization with a prime objective to mobilize work force than to meet social needs. Members need to come from same locality and they are usually full grown adults. The number of participants in average could be sixty. It exceeds hundred and also could be

less than sixty. Its power structure follows that of "molaa" with similar associated responsibilities in "molaa". Feast is served, which involves eating and drinking.

"Idir" also extends its helping hand to its member during death, marriage, and illness. At times of death and marriage, members help each other both in money and labor. "Idir" is close to the needs of the people and is commonly the most important social welfare units among the Ari.

Generally, these self-help cooperatives have maintained the solidarity of the Ari people. It is through these cooperatives that many rural families cope up with their daily miseries. Furthermore, these self-help cooperatives (social organizations) provide moral backing to families at times of birth, illness, marriage and death. It is through such self-help cooperatives that the community is able to mobilize a work group and a household obtains extra working hands from members of the other households in the community. In addition, it is obvious that for a single household such activities may require weeks or months to accomplish, but, through self-help organizations the tasks may not take more than couples of group work. Beside providing material assistance to those in need of help, it can be seen that these organizations encourage mutual self-reliance, as well as a sense of belonging and brotherhood.

The Ari have a strong orientation towards harmony and unity among clans and villages. Communal labour, collective action and group responsibility are characteristic of Ari village life. Among the Ari, the combined need for numbers of people to work together at food production and mutual defense has led to a great sense of communality.

Chapter Three: Determinants of Agricultural Production Practices and the Issue of Food Security: A Review of Related Literature

3.1. Determinants of Agricultural Production

In their attempt to study what might have constrained small farm households from perusing foreword in to producing for market and producing beyond subsistence, Workneh and Roth (2006), have identified inaccessibility of markets due to distance factors, farm size operated and the level of technology employed were some of the most important production determinants under the context of their study area in Northeastern part of Ethiopia. Similarly, Kebede et al (2006), their study in Kuyu Woreda in the Northern Showa Zone of the Oromia regional state revealed, landholding size, shortage of draught animals and distance from the market were determining factors in the production of farm households.

As per the objective of this research paper, which equally wonders why the sedentary agriculturalists of Ari have recently introduced coffee and cardamon into their production practices and why maize is also expanded to areas it has never grown before, an attempt is made below to review some of the possible factors of production in a rural agricultural setting.

3.1.1. Market and Infrastructure

Distance to markets, and the lack of roads, is a central concern for rural communities throughout the developing world. Markets, however, have fundamental importance in the livelihood strategy of most of rural households. It is a location where, as consumers farmers buy their inputs and as producers sell their products. A market is, therefore, a place where farmers spend their income from the sale of crops or from their non-agricultural activities, to buy their food requirements and other consumption goods.

Beside this crucial importance of the market for rural livelihoods, farmers usually face difficulty in accessing it. Remote location and high transportation costs present real physical difficulties. The rural poor are often constrained by their lack of understanding the market, their limited business and negotiating skills, and their lack of an organization that could give them the bargaining power they require to interact on equal terms with other market intermediaries. Consequently, poor rural farmers are usually marginalized both from local and international markets.

In a country such as Ethiopia, where the majority (90%) of the agricultural production is generated from small farm holders who are primarily producing for subsistence, market may seem to play a minimal role. As Workneh and Roth (2006) has identified in northeastern Ethiopia it is the inaccessibility of the market due to lack of infrastructure that has constrained farmers' production never because market has little role to play in their lives. As it is similarly argued by OECD (2006), market access is critical for agriculture to become the main driver of future growth for the poor. According to them, households in "rural worlds" rely heavily on access to market for their agricultural production. Generally, an increase in productivity can not be achieved with out an improvement in market accesses and vise versa.

It seems true; however, as indicated by Workeneh and Roth (2006), that out of the total small holders who produces 90% of the total agricultural production in Ethiopia, only 20% of the production goes to the market. The question should be why farmers' role in the market both in the local and international field is so minimized. And at the same time why farmers such as the Ari sedentary agriculturalists have begun to produce cash crops? Could it be the case that access to market has encouraged farmers to produce for sale?

Market in Ethiopia specially when it is in agricultural setting, is usually constrained by lack of infrastructural development such as roads and telecommunications which directly determines access to the market and marketing information, know-how which is directly related to lack of education, lack of bargaining power linked to not only market access but also choice where by price is decided by few traders who owns the market with no or little more competition. It is yet true that successful economic growth led by agriculture

depend on increased agricultural sector productivity and improved access to domestic, regional and global markets.

Many inhabitants of rural areas in developing countries lack adequate and affordable access to transport infrastructure and services. Poor access to transport constrains economic and social development and contributes to poverty. Better transport services, however, can stimulate economic activity and social improvement, leading to easier access and improves the lives of poor rural residents.

Since poor access to transport in rural areas of developing countries constrains economic and social development and directly contributes to poverty, improving rural people's access to essential services should always be a policy concern than a mere choice made between alternatives. When that is done, it will create a better mobility in rural areas and better mobility in turn gives people better access to services such as (education, health, finance) markets, income-earning opportunities.

3.1.2. Climate Change

3.1.2.1. The Climate change Debate

IPCC I, asks "Is the earth's climate changing?" and shortly answers "...Unequivocally 'Yes'" (IPCC I, 2001:25). It is never stable; climate is subject to continuing variations. Does it matter anyway? "what a silly question!" says Burroughs, and further challenges, "Any fool knows that the weather matters" (1997: IV). Yes there is a climate change, and it is rapidly becoming hazardous.

Chen, et al (1983) poses another striking question worth the subject itself. It says, "what if?" who cares if it changes? Gupta (2001:12), answers, "Climate change alas appears to be a problem in the eye of the beholder". Authorities in the field argue, though the problem is global, it is, however, immediate to those with less power to resist. "For the continent of Africa the problem poses yet another threat to the water and food security of the people" (Gupta, 2001:26).

Here we can not say the question is silly. Since behind the question lies the unexplored world of human welfare. It is when we are able to ask our selves such questions genuinely that it would be possible to address the ever remained unsolved question of "so what?"; a

question that relates to the unsettled problem of human suffering due to climate change. These, according to Chen et al, "are much more difficult questions to answer" (1983:1).

So, it won't be an accident if the relationship between man and nature is viewed as a "global ecological problem". It is global, long term, and involves complex interactions between climatic, environmental, economic, political, institutional, social and technological processes.

3.1.2.2. The Impact of Climate Change

Scientists have long debated the potential and actual impact of global climate change on human societies and biosphere. The early impacts of climate change have already appeared and scientists believe that further impacts are inevitable, no matter what happens to future global greenhouse gas emissions. In addition, the decisions we make today about the use and management of resources, infrastructure development, agricultural practices, and conservation of biodiversity will have lasting consequences. "Especially in, but not limited to, developing economies" (Environment and Development Economics, 2008:201).

It may not require being a scientist to worry about climate change rather a living or dying witness. Human societies have already witnessed disastrous consequences of global climate change throughout the centuries and as of recent decades the frequency and magnitude of the problem becomes twofold. There is nowhere that the impact of climate change could not be felt. It takes place in cities, towns and villages. Although climate change has cast a dark shadow on Western countries, it has knocked the worlds poor hardest.

These environmental challenges coupled with the limited capacity of public institutions to meaningfully respond to the challenge can have significant impact on economic, social and cultural development. As a result, such climate-induced changes might gravely disintegrate social welfare, family affair and nation's economy among the poorer. "Some obvious linkages exist between climate change and society, including impacts on the vulnerable populations often unable to withstand long-term reoccurrence of climatic hazards such as drought" (Salih, 2001:203).

Various authorities argue that at present climate has become a concern of the entire world and that it is becoming more and more unpredictable in Africa. (Commission for Africa 2005). And this situation is terrible in sub-Saharan region of the continent. "The impact on food supplies was catastrophic, the effects being exacerbated in Ethiopia, Chad and Sudan..." (The New Encyclopedia Britannica 1993:495). As Scholars argued, the situations in these countries, beside natural fluctuations of the climate, are being reinforced by miss-use of natural resources by the people. According to Mintzer, "among nations, the developing countries are particularly vulnerable to the impacts of climate change...this is specially so for those...which are economically dependent on agriculture...the poorest of the poor ...often dependant on subsistence agriculture..." (1993: 4-5).

The impact of climate change and the human struggle to adapt is more adverse in areas of rain fed-agriculture where a shift in characteristics of climatic variables will result in a greater damage to food security and livelihoods. Since that is so, the poor needs to make adjustments to its traditional practices based on the change in the timing, duration and distribution of climatic elements. Moreover, farmers produce their livelihoods depending on the prevailing climatic condition and their production practices are outcomes of their own long standing experiences with such conditions. According to Chen and et al, "understanding the nature-society interface has become an important new agenda item for the social sciences" (1983:3).

3.1.2.3. Climate Change and the Third World Countries

Scientists have proved climate change impacts will be for the globe as a whole. Although explaining the regional and local level climate variability is left with so much to do, the most pressing problem is "where will the impacts be felt and who will be the most vulnerable" (Gupta, 2001: 22).

Africa, a home for the majority of third world countries is socially and economically vulnerable to environmental hazards being amplified by changes in the global climate. Its natural resources viable to its poor inhabitants are alarmingly degraded. Drought for instance, both in its frequency and extremity has become ever damaging. This scenario is the nastiest in sub-Saharan Africa.

The issue of agriculture and food security is at the front page of the government's agenda in many of the African countries. This has been argued by the IPCC (1998) report on the regional impacts of climate change as follows:

Except in the oil-exporting countries, agriculture is the economic mainstay in most African countries, contributing 20-30% of GDP in sub Saharan Africa and 55% of the total value of African exports. In most African countries, farming depends entirely on the quality of the rainy season-a situation that makes Africa particularly vulnerable to climate change. Increased drought could seriously impact the vulnerability of food, as in the horn of Africa and southern Africa during the 1980s and 1990s. (IPCC, 1998: 8-9)

The horn of Africa is heavily affected by recurrent drought beside being the most unstable politically and the least developed economically than any other region in the whole world. Ethiopia is not an exception in this regard and may probably add something to the menu of problems. "... [It] has severe climate variability that results in low agricultural production. Low and erratic rainfall in the whole country has led to a decline of cereal production" (Girma, 2001: 820). Ethiopia is a country particularly vulnerable to the impacts of climate change because of factors such as widespread poverty, recurrent droughts, and overdependence on rain-fed agriculture.

3.2. The Issue of Food Security

The concept of food security emerged during a period of serious food shortages at the global level in the 1970s. During this period the debate on the international food problem has brought the concept of food security. Since then the concept has been transformed so many times. As a result there has been observed a continuous rethinking over the concept of food security.

During that time when the whole world was hit by massive food shortages, food security was argued based on whether to get the amount of food needed to sustain life both at the national and global level. Adequacy or sufficiency as it was understood during that time; food security was viewed to be the availability food than the access to it by the various segments of the society (Maxwell 1996: in Legesse 2007).

Consequently, massive production of food was given priority during the early phase of the food debate in the international and national food security policies. For this reason, access to food by individuals and households of varied walks of life has not been recognized. Gradually, the issue of food security becomes a matter of 'access than availability of food both at the global and national level food debates when food production was intensified and resulted in aggregate food availability but never reached the poor. "Despite increases in global food production, significant portion of population of the third world countries have been suffering from hunger and malnutrition" (Legesse, 2207:21).

Accordingly, the views that food self-sufficiency by nations does not guarantee the acquisition of food by individuals or households gained prominence. And hence, a boundary was made between food self-sufficiency and food security. This time food security became an issue of entitlement/access than availability of food elsewhere out of the reach by the poor. Amartya Sen's 'Entitlement approach' has made great effort to conceptualizing food security issues from the vulnerable segments of the society's point of view. This approach emphasizes the access to food by the poor no matter where the food might be. But primarily, through own production and marketing of goods and also other alternative means of earning a living through mobilizing local resources.

In contrast, however, in many countries of the world where food self-sufficiency is already attained, individuals and households continue to be food insecure due to lack of entitlement and poor food system associated with poor infrastructure. Throughout the 1980s in most of the developing countries the concern of food security has become an issue of vulnerable individuals and households than continue to be national and global concern.

As time goes on and the world net food production improved, local and regional food policies were geared towards improving entitlement opportunities of the local people. Following the shift in emphasis, therefore, new concept of food security emerged where people needs to have access to sufficient nutrition in addition to having access to food alone. The following quotation reveals the shift in emphasis given to food

security overtime. "Food security is a situation that exists when all people at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and nutritious food and food preferences for an active and healthy life" (FAO, 2002).

Chapter Four: “Diminishing Crops” and Limiting Factors of Production

4.1. “Diminishing Crops”

As stated in the introduction of this research work, these were crops whose production has been declining due to interrelated factors. Tef, sorghum and ensete were crops grown abundantly in the lowland and midland areas, but, gradually diminished.

4.1.1. Tef

Tef scientifically known by “*ergarostis abyssinica tef*” and whose vernacular name “gachi” was exclusively mentioned being a staple food of Ethiopians.

Although, its production has been widespread long ago throughout much of the highlands of northern and central Ethiopia, both its introduction to the Ari land and disappearance were a very recent phenomenon.

Like other “*Colonial Crops*”, such as maize and wheat whose introduction to Africa has been repeatedly mentioned in literature with the upcoming of colonialism, analogously, tef was introduced to Ari following the incorporation of Ari under the Abyssinian state in the late 19th C. “It is believed that the Amhara brought this plant with them at the beginning of the twentieth century” (Gebre, 1991:51).

Unlike Sorghum, tef was only identified by its color among the Ari, and it has no local expression to explain its utility and essence. Concerning tef, therefore, the Ari have no detailed knowledge of the kind they have on sorghum and ensete. Quite different from other tef growing people who use it as a staple food, the Ari grow it basically for market purposes. Tef was rarely used for household consumption. ¹Though people prepare varieties of food from its flour such as ‘injera’ and bread, it was often produced for transaction than consumption purposes. Unlike crops such as ensete and sorghum tef has no place in the ritual life of the Ari society.

¹ “Injera”; thin bread made up of tef flour. “Tef (*eragrostis tef*) is a significant crop in only one country in the world-Ethiopia” (NRC1996:215).

Its production, which requires repeated plough of the soil, was a challenge to the Ari farmers the majority of whom lack a pair of oxen plough. Land preparation usually begins during August and September and involves activities such as clearing weeds and trees using fire and tools. This was also accompanied by tedious plowing using pair of oxen. It is difficult to grow tef among households who have no oxen since the crop requires a much softened soil. Sowing takes place in September and October after the soil has been wonderfully softened and unnecessary weeds and plants were avoided. Sowing was usually followed by a couple of weeding activities carried out in November. The harvesting of tef was carried out in late December and early January.

According to the oral information received from informants during focus group discussions, the majority of farmers have given up producing tef some eight to ten years ago. The unreliability of weather during the indicated period was resulted in a total crop failure and since then farmers were unable to easily get its seeds. Few farmers have also reported that the unpopularity of tef both in the dietary culture and ritual life of the people has made its decline in production inevitable and its disappearance accelerated.

Out of the sixty households surveyed in the study area, only three households have reported they have grown tef in 2007/8 production season. These households have also commented that the land on which they have grown tef compared to other crops is very negligible. They have grown tef on less than a "timad". "Timad" is a local measurement of land. According to the information received from development workers one 'timad' was equivalent to 0.25 hectare.

Regardless of tef's potential to grow in humid, dry and upland areas, and even though, it was considered an important cereal crop for the rural economy, the Ari have ceased its production. Despite the people's comment that the production of tef has been abandoned by the changing climate, it was known to be a reliable cereal for an unreliable climate. Of course, tef do well under conditions of water shortage because of its early maturity which

enables it to escape drought by allowing it complete its life cycle before serious soil and plant water deficits develop.²

Tef's nutritional/food value is also high compared to other crops grown by the Ari farmers. "Tef has as much, or even more, food value than the major grains: wheat, barely, and maize, for instance" (NRC, 1996:222). Tef is very much nutritious since it is about 13 percent protein, well balanced in amino acids, and rich in iron. Despite this fact however, it continues to be a common belief among the Ethiopian public that tef has nothing nutritive except "iron."

Four important factors could be responsible for the disappearance of tef from the Ari agriculture. The major one is drought explained in terms of the temperature of the area which was generally increasing and the erratic rainfall in the last three decades threatening not only tef but also other major food grains grown by the Ari. The second one was the unpopularity of the crop in the dietary tradition of the people which makes them less worried about it compared to crops to which their ritual life and dietary tradition is highly tied. As Gebre (1995:51) stated, "tef took several decades to be accepted by the majority of the Ari people" The third and very important factor mentioned by farmers was the lack of seeds which was created following the complete failure of this crop some eight to ten years ago. Moreover, the cultivation of tef which requires a special skill and tedious activities both during production on the field and during consumption at home has discouraged farmers who used to produce it.

The impact of this scenario on the food security situation of the local people could be argued from different perspectives. One was the potential of tef to grow in difficult environmental conditions in which other crops fail to survive. The other was its potential to mature in a relatively short period of time which makes it advantageous over other crops such as sorghum. And its nutritive value which beside the crude acceptance to be

² Though he argued that tef's potential in productivity is less compared to maize and sorghum, Seyefu (1989) stated its potential to serve farmers out of drought at times of complete crop failures due to moisture stress. "If the crop fails due to moisture stress, they plough the maize under and the plant sorghum. If this fails too, it is ploughed under and tef is sown as a last resort. This clearly shows that tef is grown in some areas when farmers cannot grow maize or sorghum due to the weather limitation during that season" (Seyefu, 1989: 286)

poor is in reality well balanced compared to other crops grown by the local people such as wheat, maize, sorghum and barely.³ Its ability to withstand weevils in store, that it has few pests and diseases in the field compared to other crops such as maize which were opposite in all regards as far as the above mentioned qualities of tef is concerned. That could have been the secret behind its domestication in the Ethiopian agriculture for such a long period of time. These and other possible advantages of tef over major food grains grown by the Ari and its huge contribution to the food security of the local people were compromised.

The table below shows the nutritional composition of tef compared with other cereals grown by Ari farmers. It is clearly evident that tef is nutritionally competent. It is rich in minerals, protein and carbo-hydrates compared to crops such as wheat, maize, sorghum and barely.

Table1: COMPOSITION OF FIVE GRAINS (PROXIMATE ANALYSIS)

Component	Tef	Wheat	Maize	Sorghum	Barely
Protein	11.0	11.0	9.4	8.6	8.5
Fat	2.6	1.9	4.4	3.8	1.5
Carbo-hydrate	73.0	69.3	69.2	71.3	67.4
Minerals	3.3	1.7	1.3	2.4	2.6

Source: Seyefu Ketema (1989)

4.1.2. Ensete

Ensete (*ensete ventricosum*) was exclusively domesticated in Ethiopia (Tsedeke et al., in Dange 2004). Although it was found throughout much of Central, Eastern and Southern Africa as well as Asia; its cultivation was exclusively practiced in Ethiopia (Shigeta, 1991).

It is also astonishing that most of the ensete growers in Ethiopia are linguistically from Omoti to which the Ari linguistically belongs. Most of these people live in South-Western part of Ethiopia mainly in Southern Nation Nationalities and Peoples region.

³ "Tef has much, or even more, food value than the major grains: wheat, barely, and maize, for instance" (NRC, 1996:222) The book further argues tef has 9-11 percent protein, the protein type is highly digestible, the level of minerals is good, and that it is rich in iron, calcium, potassium, and phosphorous.

Some twenty out of twenty six major ensete growers were linguistically Omotic and significant numbers of them were found in South Omo valley (Tsedeke et al., in Dange 2004). Ensete was not only the dominant production practice among the people in the South Western Ethiopia, but, it has also been a primary diet and food culture.

No specific season was required for ensete farming. This was especially true for harvesting. People may prefer a sun light than a rain during harvesting yet, it can be done anytime. Nevertheless, it requires people to wait until its full maturity unless they were starved and hit by a food shortage.

Ensete was often consumed as food, but, it was rarely made for drink. Once the plant is matured and ready for harvest, the process of making it involves series of steps specific to the type of food to make. A cooked ensete corm served with cabbage is called 'Mossa'. Ensete can be made bread among the Ari; and unlike 'kocho' in other places such as Gedeo, Guraghe, Wolyita, etc, the Ari make a distinct type which they call 'Washi'. Ensete corm could be served alone after being boiled and the Ari call this 'Zuni'.

Plate 3: Varieties of Ari Ensete Food with Drink Prepared From Coffee Leaf

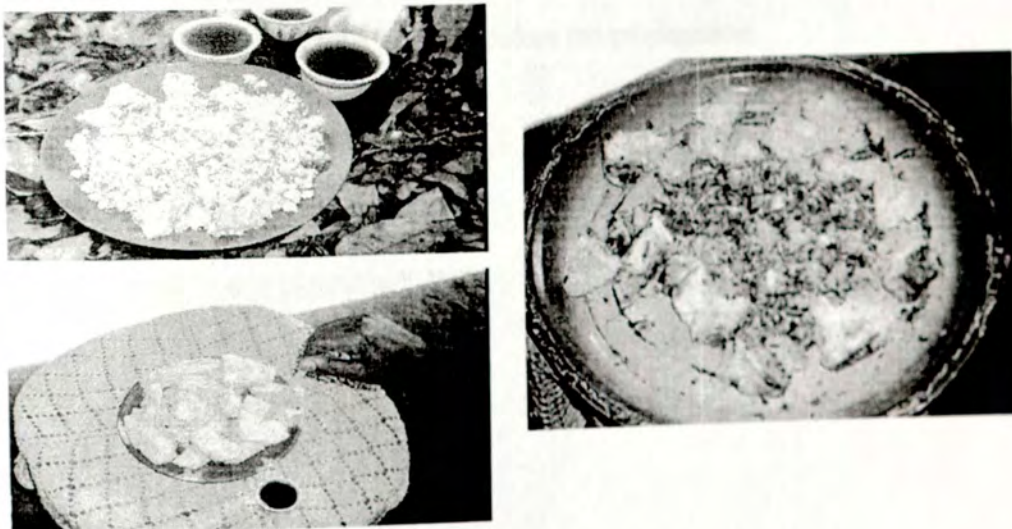


Photo by: The Researcher (January, 2009)

Under moderate rainfall and sufficient land, ensete can feed significant number of people. Its nutritional value, unless supported by additional food intake, however, can not satisfy the food requirements for a healthy life. Beside being a food heritage, ensete with the Ari continue to be a material culture since the people utilize it for multiple purposes. Its leaves are useful for wrapping, thatching and sheeting purposes. The pseudostem can be made fiber and used for tying livestock and bundling objects. Most of its body part serves as a fodder.

Therefore, ensete (aqim) growing was beyond a food culture among the Ari. It is part of their material tradition since they use the plant for making equipments and tools. As Shigeta (1991:49) wrote, "the know-how of making ensete material cultures is widely distributed among the Ari People; from the young to the old, of both sexes." Therefore, ensete gives the Ari a distinctive cultural and physical identity besides its economic significance.

The Ari does not use seeds for ensete multiplication. They rather employ a special propagation through bud formation. The propagation activity requires a matured ensete plant. A grownup ensete plant is usually 6-8 years old and this plant is first excavated from the ground and cut in to two major parts: corm and pseudostem. Then, the corm is slashed into two equal pieces, buried and gently covered with fine soil. The land for this purpose is already prepared at least a month before the propagation.

Plate 4: Ensete Propagation Among the Ari



Photo by: The Researcher (January, 2009)

Not more than half a year, the buried ensete plant will produce a number of sprouts/buds. The following step involves transplantation of the buds to a nursery area. Again after the buds are raised in a separate place for some two to three months of time, they will be planted dispersedly for one more time since pairs of them were planted together in the previous step. This is the last phase and place of ensete propagation among the Ari. Though it is said generally that crops grown in the “tikam” requires less energy and time, farmers reported that, serious steps are followed and intensive care is required in the process of ensete propagation.

Plate 5: Case Story on Crop failure in Arkinti



•According to an Elder from North Arkinti, the production of peas and beans failed in the last four years due to bad weather conditions; two extremes of heavy rain and dangerous heating of the sun. As a result, people were hungry and children died of malnourishment. In those days, it was ensete which has sustained their lives. They call it "the life saver"

Photo By: The Researcher (January, 2009)

Despite its enormous relevance to the food security of the Ari people, and its demographic implication to support significant amount of population elsewhere in the country, the production of ensete has been declining in the lowland and midlands areas of Ari. People in the lowlands have begun buying the ensete plant from the highlanders. According to information received from farmers in Arkinti, a single ensete plant begun to be sold for about 30-50 ETB. The ever increasing temperature has killed most ensete crops in the lowlands and part of midland areas. The other reason for its extinction was the introduction and sub sequent expansion of coffee to places where ensete was formerly dominant. Farmland such as "tikam"; which was formerly dominated by ensete crop was gradually conquered by coffee. While coffee expands its territory in the "tikam" and possibly in the "wonam", ensete was made captive of the "tikam" territory with limited space in the "tikam" itself compared to previous dominance in this field. It was because coffee plant begun to dominate the limited space the Ari farmers have reserved for crop production that ensete plant was declined as some informants mentioned. The majority of the farmers, however, claim that the ensete disease was responsible for the decline. Informants said that ensete was only destroyed whenever hit by a disease. As the Ari

farmers have indicated, “durka” and “ocha” were the main problems of their ensete production; though increased temperature has also caused a decline in yield. “Durka shows the symptoms that firstly outer leaves become yellow and inner leaves and pseudostem gradually becomes wilting and finally whole plant dry out” (Shigeta, 1991:31).

Ensete was known to be drought tolerant and able to support many people on a small amount of land. At times when all other crops fail to survive, it would be ensete that can feed people and sustain their life. The case in Arkinti in the latest four years was a good example. In those years, when barely, wheat, peas and beans were knocked by drought; people survived because of their ensete crop. Even though the death of children and old people was apparent; farmers in Arkinti were however, confident when they call their ensete crop “the life saver” as it saved them from mass death. The declining volume of ensete crop will have dire consequence to the food situation of the local people unless some possible measures are taken to insure the food security of the area on sustainable basis.

Plate 6: Ensete Cultivation in the cold highland Arkinti



Photo By: The Researcher (January, 2009)

4.1.3. Sorghum

"Sorghum is the dietary staple of more than 500 million people in more than 30 countries" (NRC, 1996: 11). Sorghum scientifically known as "*sorghum bicolor*" and locally called "ribi" was beyond a food heritage among the Ari. It was one of the culturally honored crops grown in the area. As a result, it was used during ritual and cultural practices not only as food stuff but also as the basic ingredient of the ritual itself. The people's local knowledge of the existence of many varieties of Sorghum could be taken as evidence. (Gebre, 1995) has identified around 27 varieties of Sorghum out of which 17 were considered native to the area. Moreover, the fact that this crop was the oldest of all the crops grown in the area justifies that this crop has a long history with the Ari people and special place in their lives.

Sorghum has been widely produced/grown in the lowlands. Here the white sorghum was preferred because of its capacity to endure harsh climate. Moreover, its market value and productivity was recognized by the farmers growing it. It was, however, commonly criticized for its farming practice needs heavy work and continuous follow up.

Since it takes six to eight months for its maturity sorghum was cultivated once in a year. Unlike earlier days where the Ari raise sorghum in the wild grass, they begun to use oxen drawn plough for the preparation of the soil. Clearing land was the first step undertaken in the process of sorghum cultivation. This was done usually in April. Clearing was done in order to avoid weeds and other plant invaders from the farm. Repeated toiling of land was done after land has been cleared. Sowing takes place in May after a series of toiling activity was undertaken in April. Frequent weeding activities were carried out until the time of harvest which usually takes place in December or February.

The harvesting of sorghum takes place as it is already indicated above in December and February. A multipurpose locally made tool "wali" was used during harvest in order to cut sorghum plant. This material which is made up of an iron tip on a wooden handle is used at every step in the crop production practices of the Ari.

Sorghum has a special place in the economic and ritual life of the people. Economically it serves as home consumption and market exchange while it was served during various rituals and ceremonies as "gola" a locally made beer. This drink can be made from maize and ensete as well but the Ari esteem the one made from sorghum. "Gola" was also served during rituals, weddings, funerals, work party sponsored, etc

Birds' attack which was a special phenomenon with the white sorghum was also a constraint to its production in the lowlands. "A tiny bird is perhaps the greatest biological limit to African cereal production...quelea occurs only in Africa, but there its population is estimated to be at least 1.5 billion" (NRC, 1996:273). In a matter of hours these seed-eating birds could destroy the entire grain crop. They were numerous and destructive. It was said that in previous times child education in Ari was partly constrained by these birds since children were needed at home to keep sorghum crop from the damage by these tiny but destructive birds. Below is a story of these birds:

Case 1: A Story of a Farmer who was forced to stop producing Sorghum due to birds attack

There was a farmer in the lowland Ari. While every one in his village ceased producing sorghum, he continued to grow it. Finally he gave up of any hope to growing Sorghum when every bird (feket) of the village have to visit his farmland which was the only sorghum field they could destroy. And he also gave up soon for when he was unable to bear protecting their large number. (Shigeta Reported during a pre-filed work discussion made with him by the researcher)

This crop, whose previous production has been restricted to the lowlands and midlands, has begun to grow in Akamer where formerly red sorghum was widely grown. Birds hardly touch the red sorghum because of its natural bitterness. As of recent years, however, the white sorghum begun to expand to the highland areas where it has never grown before and in the highlands of Akamer it was introduced some two-three years ago. As white sorghum gradually dominates the midland altitudes, red sorghum was also retreated northward towards the formerly very cold highlands dominated by barely and ensete cultivation.

Sorghum was better adapted to semi-arid conditions than the other major crops grown by the Ari crops such as maize or wheat. Complete failures due to limited rainfall were less frequent than maize or wheat crops under the same conditions. It also quickly recovers as soon as moisture-stress conditions.⁴ Its drought tolerance commonly attributable to its extensive rooting system which allows it escapes or tolerate drought. Regardless of its potential of untapped variability in grain type, plant type, adaptability and productive capacity sorghum production has been compromised and with it the food security of the local people.

Generally, beside its significance in the daily diet of the Ari as a staple food and also its significance in their ritual practices, its yield was ever declining. As a result, it seems loosing economic significance to the people. It does not seem loosing, however, its central place in the cultural life of the people for its production was not completely ceased and its consumption habit still alive.

To sum up, a food heritage which has fed the Ari people for generation after generation was sorghum (ribi) and it was a local legacy of genetic wealth. Writing on its potential to feed several billions of future children to come, NRC (1996) in *"Lost Crops of Africa"* noted, this crop was perhaps the world's most versatile food crop.

⁴ Farmers choice of cereal crops includes a response to the environmental situation in space and time, especially to constraints such as soil moisture stress and water-logging (Seyefu, 1989:286)

Plate 7: Sorghum in Northern Akamer



Photo by: The Researcher (January, 2009)

4.2. Limiting Factors of Production

The Ari agriculture from which the majority of farmers drive their subsistence requirements was constrained by many complicated problems. Climate change, lack of agricultural inputs, limited coverage of extension service, limited off-farm income generating activities, population pressure, insufficient landholding size, absence of financial services, pests and plant diseases, birds attack, etc; were some of the major constraints to the Ari food production.

4.2.1. Climate Change/Variability

Changes in the local weather conditions in the last three decades have caused damages to the socio-economic and environmental fabric of the Ari. The rise in minimum maximum and mean temperature, coupled with an increase or decrease in rainfall in the area, were some of the metrological changes responsible to have posed challenges to the Ari agriculture. Consequently, food supply has been significantly altered by such extreme weather events.

The impact of climate change/variability on the Ari production practices has been repeatedly mentioned throughout this research paper to have been severe. Heavy rain and dangerous heating of the sun were the two principal causes for crop failures. Shortage of rain during land preparation and crop sowing and unnecessary rain during the time of harvest, were some of the metreological challenges affecting their crop production. As it is noted by (IPCC, 1998:38), “of the money climatic factors that are important for plant growth, among the most significant in relation to climate change are temperature, water availability (Determined by precipitation and soil characteristics as well as other metreological variables”.

4.2.1.1. Rainfall

Climate variability, in terms of unreliability of rainfall and inter-annual and intra-seasonal variations in precipitation, was a major cause of drought and associated crop failures in the area. The unreliability, rather than the volume was the major problem of rainfall. In the last three decades, the rainfall record at Jinka shows an increase in volume. As the value of the trend line indicates, each year the amount of rainfall increased an average of 2.8 mm. In three decades time, it means an increase of nearly 84 mm of rainfall. Even if rainfall could still be a problem to the Ari agriculture, it would not be the volume rather its internal variability.⁵

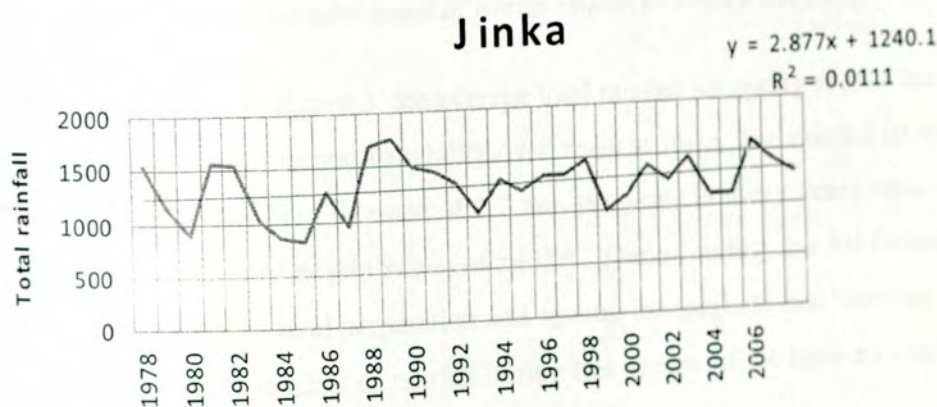


Figure1: The Trend of Average Annual Rainfall at Jinka from 1978-2007

⁵ The amount of rainfall in Ethiopia has been constant for over five decades when averaged nationally. However, there were diverse patterns between different agro-ecological regions of the country. (In the Green Forum Conference Proceedings No 2 2008)

While the volume of rainfall increased over time as the above figure reveals, the intra-seasonal rainfall distribution shows a highly variable trend. The rainfall trend, even though when looked at annually in the above figure showed an even increase in the last three decades, its distribution in winter season during the same years, however, prove a highly erratic/variable trend. (See figure 2). It was also the case that while the annual rainfall trend increases overtime, the sum total rainfall for winter season generally declined. According to (Ashley,1992:2), "there is a great deal of land which is effectively semi-arid or even arid for part of the year, despite having ample rain during the rest of the year, and an annual rainfall total which at first glance indicates that crops could not possibly suffer from drought." ⁶

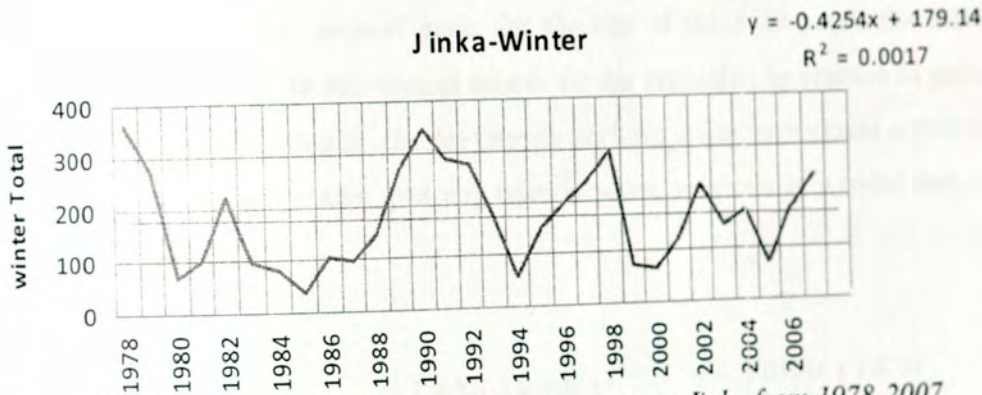


Figure2: The Average rainfall trend of winter season at Jinka from 1978-2007

As it can be seen from figure 3, the average total rainfall for spring season has generally increased with a high internal variability over years at Jinka. The rainfall trend of spring at Jinka shows an average increase of 2.7 mm per year. In thirty years time, this was a considerable increase of nearly 81mm of rainfall. During spring, the Ari farmers perform farm activities such as land preparation and sowing for sorghum and weeding for maize. The high internal variability of rainfall during this season might have an implication on crop yield.

⁶ The distribution of rainfall within a season influences the quantity of vegetation produced. The uneven distribution in time and space can cause dramatic crop failure. (De Boer, in the Sahelian Pathways 2005:17)

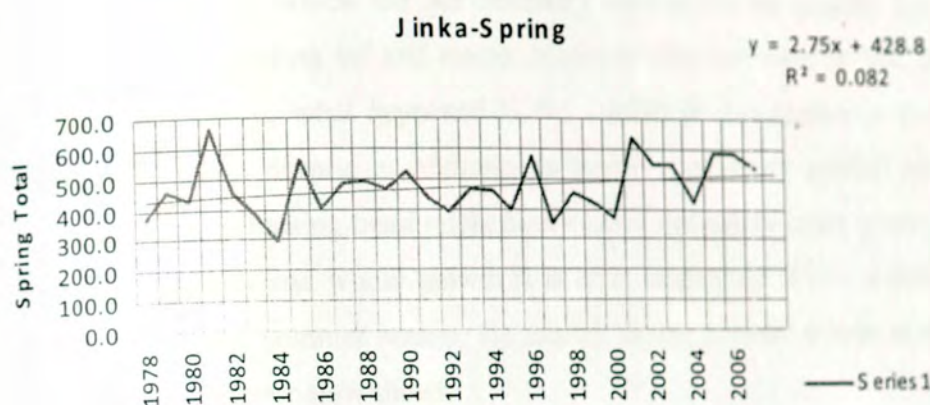


Figure3: The Average Rainfall Trend for spring at Jinka from 1978-2007

The rainfall record for summer season in which the study area usually receives the highest rainfall has shown steady decline overtime in the last thirty years as the metreological recorded at Jinka revealed. Except for the year 1998, where the average summer rainfall hits its unusual peak, for the rest of some 29 years, the rainfall has significantly declined. In this crucial season for the Ethiopian agriculture in general and for the study area in particular, the Ari farmers perform major agricultural activities. Land is prepared for tef and maize, pea and bean is sown, sorghum is weeded and maize is some times harvested.⁷

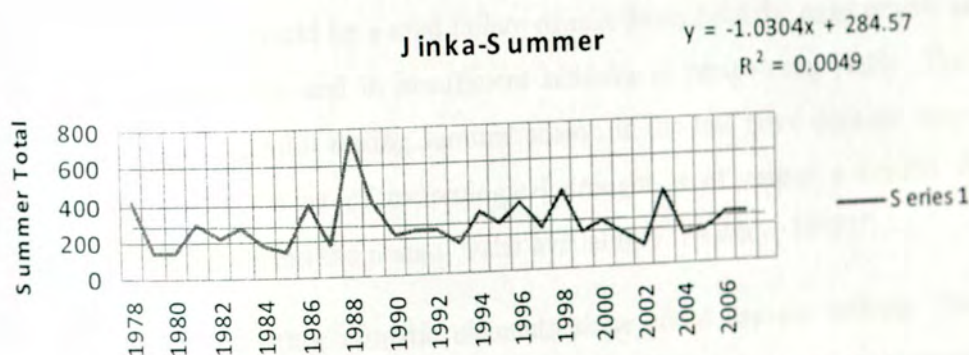


Figure4: The Average Rainfall Trend for summer at Jinka from 1978-2007

⁷ Weather changes increase crop vulnerability to infection, pest infections, weeds prevalence, etc... The increase in such extreme weather events will affect both developed and developing countries with lesser coping abilities" (Wondwossen Sintayehu, in the Green Forum Proceedings No 2, 2008).

Autumn is a time in which the Ari sedentary agriculturalists usually perform farm activities such as weeding tef and maize. Maize is also harvested in this period. The following table shows, what happened to the rainfall in this season in the last three decades. This season despite its relevance in having a moderate rainfall important for crop maturity, its increasing trend might have caused damage to crops whose harvesting time is onset (maize) and whose growth is at early stage (tef). While a declining trend was pertinent during summer season, the rainfall during autumn season is significantly increasing as the figure below shows.

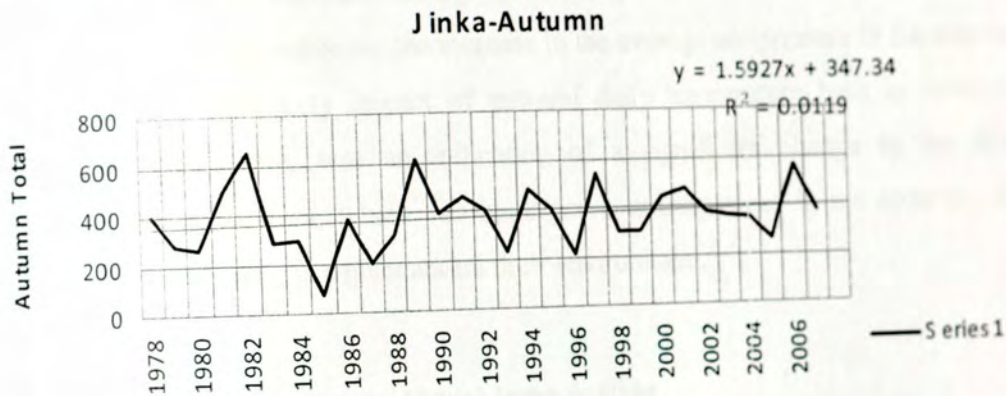


Figure 5: Average Rainfall Trend for autumn at Jinka from 1978-2007

When such a variable situation occurs among various seasons within a year, Ashley (1999) argued, there could be a total failure of rain throughout the most crucial season or it may fall sporadically and in insufficient amounts to secure crop yield. The case of declining trend of rainfall during summer season in the last three decades supports this idea. "The primary cause of meteorological drought is of course a rainfall deficit, a protracted departure from the normal water availability" (Ashley, 1999:7).

The rainfall or any other climatic elements alone could explain nothing. They were, however, crucial as they appear at the various development phases of crops grown. When a rain starts late or finishes prematurely, the likely impact of such conditions on crop wellbeing could be damaging. This is because, when seen against the various developmental phases of crops, the timing of the rain over season is as important as its total amount. According to informants, the nature of the rain which was abnormal in its distribution was the major source of crop failure. They said, at times it comes in a heavy

weight that kills crop and demolishes soil. And at some other time, it comes in a light shower which does not penetrate the soil.⁸

4.2.1.2. Temperature

The figure below indicates that, the temperature trend at Jinka in the last three decades has generally increased. The average increase of maximum temperature for one year was estimated to be 0.027°C . This was roughly a 0.8°C increase in three decades time. Similarly, the minimum temperature also increased on average 0.01°C which was approximately 0.3°C increase during the same period. The fact that the maximum temperature was responsible for the increase in the average temperature in the area makes sound to argue, the likely impact of unusual daily temperature both in volume and magnitude. This alone, was an indication of a significant change in the climatic characteristics of an area, which can have grave consequences in the economy of the poor; whose well being is dependant on their environment.

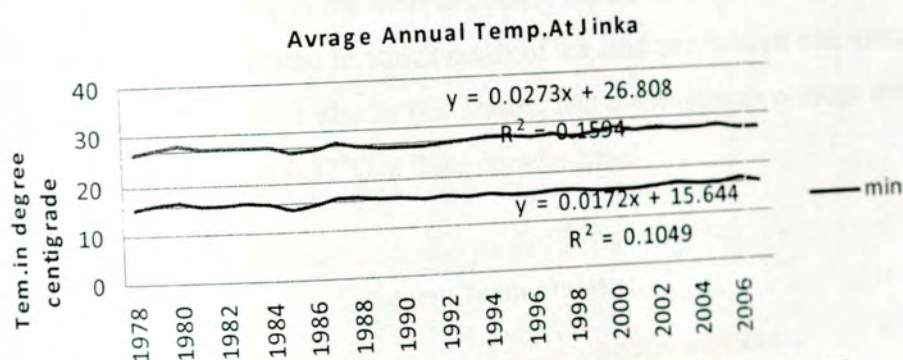


Figure6: Mean and Max annual temperature at Jinka from 1978-2007

Below a figure is given which provides the minimum and maximum average temperature record of thirty years at Jinka for summer season. It is important to note that this season has experienced a decline in the amount of rainfall in three decades time. At the same

⁸ As rain-fed agriculture is the mainstay of over 85% of the population, the amount, variability and intensity of rainfall are very important for Ethiopia. There is scientific evidence that rainfall in sub-Saharan countries has recently been lower in amount and erratic in its distribution. Climate change therefore will greatly disrupt the food supply and the production of agricultural outputs. The population's very limited capacity to adapt to new climatic conditions and the absence of pre-existing adaptation mechanisms are the other factors that worsen the vulnerability of the country to the effects of climate change. (Wondwosen Sintayehu, in the Green forum proceedings No 2, 2008:59-60).

time it is a season in which both the maximum and minimum temperature has significantly increased. Having in mind the place of this season in the agriculture sector of the country as whole and to the Ari specifically, it would be sound to argue crop failures and yield decline were resulted; an idea which supports farmers' opinion of yield decline and food shortage overtime.

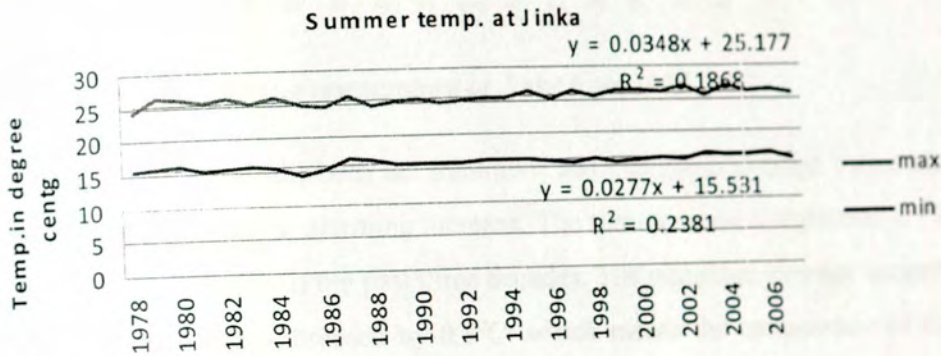


Figure7: Average summer temperature at Jinka from 1978-2007

Next to summer, spring is the most important season as far as the agriculture of the Ari was concerned. It is a time in which much of the land preparation and sowing of "ishin" crops is undertaken. It is also in this season, that the minimum average temperature has increased an average of 0.37°C in three decades time.

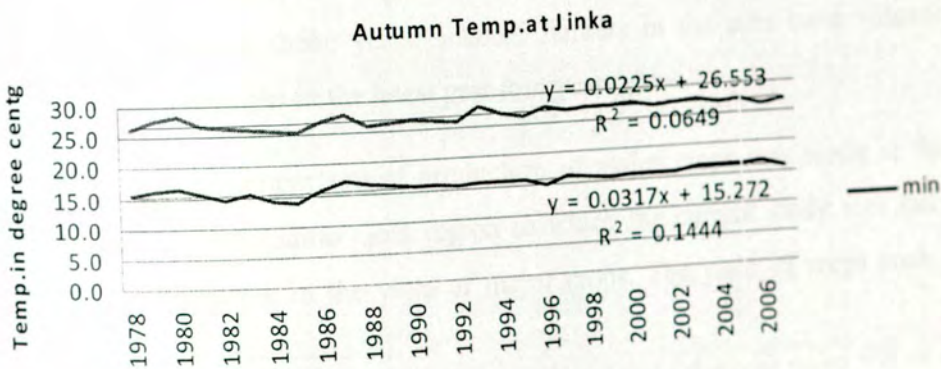


Figure8: Average autumn temperature at Jinka from 1978-2007

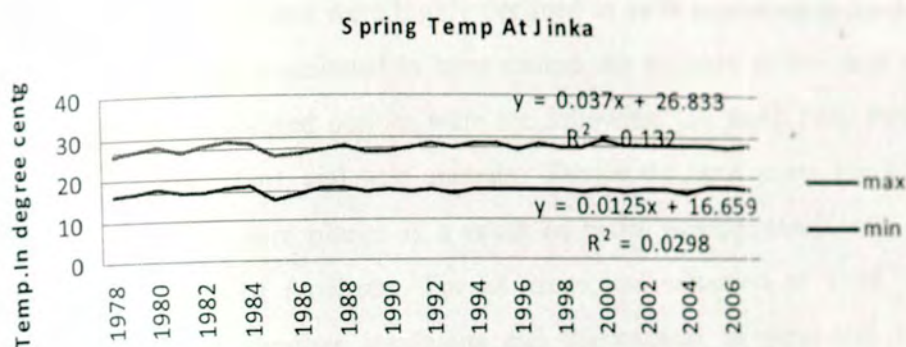


Figure9: Average Spring temperature at Jinka from 1978-2007

For summer and autumn, both the minimum and maximum average temperature for the three decades showed an alarming increase. The summer season registered a 1°C increase in average temperature in the past three decades. The minimum average temperature over the same period also increased by 0.8°C ; which means the temperature of the summer season is generally increasing from time to time in the last few decades. The same is true for autumn where the maximum and minimum average temperature has showed an increase of 0.6°C and 0.9°C respectively. Generally, the temperature in the area has increased significantly with an intra-seasonal variation.⁹

In general, over the past few decades abnormal weather conditions were likely to have caused crop failures as the metreological evidences of some thirty years recorded at Jinka station revealed. Prolonged drought, heavy rain and dangerous temperature were likely to have occurred during those years. Indeed, farmers in the area have witnessed grave consequences of drought in the latest past four years alone.

During 1977/78 a comparison of production of major crops was made at the national level and in the then Gamo Gofa region to which the current study area belongs. The result shows, a decline in the yield of major crops. The yield of crops such as wheat,

⁹ Climate-induced changes to crop yields; ecosystem boundaries and species ranges will all dramatically affect the distribution and productivity of agriculture. Climate-related threats to food security, water and energy security and the increased incidence of vector and water-borne disease will further undermine Africa's ability to develop. The changes in climate have been proved of having significant effect on the potential production especially of the agricultural sector and hence African food security problem. (Commissions for Africa, 2005:249).

maize, sorghum and beans were highly declined in 1978 compared to the previous year 1977. Major reasons mentioned to have caused the decrease in the yield of the above crops during the indicated periods were the following: too much rain, shortage of rain, pest, plant disease, hail, and wild animals. During the same years, the yields of crops were increased in other places as a result of better weather conditions, expansion of farmland, and use of fertilizers. For all crops, the reduction of yield was primarily resulted from bad weather conditions and the increase in yield was attributable to improved agricultural technology such as use of fertilizers (Ministry of Agriculture, Crop Production Survey 1978/79).

4.2.2. Population Pressure and Land Fragmentation

Food shortage has always been the crucial problem of developing countries in the struggle to feed their fast growing population. The population Ari, which has grown extremely fast over the past two decades, is another challenge to the Ari agriculture. During the last twenty three years, every year, 7437 thousand people were added. This has obviously created pressure to the resource base of the area. Its implication for the food security was hence, significant. As the population of Ari increases (CSA, 2007), and the production of food crops declines overtime (Gebre, 1995), it is likely that the Ari will become food insecure. Moreover, as land continues to be too small; while inherited from father to sons, it is likely that the productivity declines due to over-exploitation. The declining fertility of soil in the areas was partially resulted from this fact beside the unsustainable use of the natural resources such as deforestation and erosion.

Case2: Opinion of a framer on the population growth of Ari

It is not only a population increase. It is rather a flood. Look at every household; several wives and numerous children. Few decades ago, this was not the case. It seems as if people are imported than born here. Land was abundantly available and children had enough to eat. Crops were productive and the weather constant. Now, every thing is changing. I don't think people are aware of the causes, but, continue to bear the consequences (Teklu Dizi, a farmer in Akamer).

Demographic pressure, therefore, obviously begun to influence farming activities of the Ari. A small piece of land has to support significant number of people.

4.2.3. Pests and Plant Diseases

Crop diseases and pests were always been potential limits to agriculture in rural areas. Farmers in Akamer and Arkinti said there was an insect called "sada"; which emits a waxy liquid on the leaves of ensete thereby makes it gradually rot and die. That is not true for development workers. They argue, there was no such thing as insect destroying ensete just for it landed on their ensete plant. For them, nevertheless, the disease was caused by microorganisms/bacteria which can easily be transmitted from one plant to the other through contamination; whenever the plants grow very near to one another, and, whenever a new plant is replaced on the contaminated soil on which a plant dies out. "Most probably, the "durka" can be caused by bacterial wilt (*Xanthomonas musacearum* sp. n.)" (Yirgu & Bradbury 1968 in Shigeta 1991:31).

The solution development workers forward was that, farmers should burn the soil on which a plant dies out or they should leave that specific place fallow for few years. Farmers should also wash sharp materials they use for harvesting ensete plant before using it for the next. The extension efforts to reduce the impact of this disease were not successful as development workers in the area commented. This was because of farmer's lack of readiness to listen to extension workers; which was attributable to farmers' lack of education, which again keeps them away from conceptualizing extension education.

Another constraint to ensete cultivation in the area was an animal in underground which feeds on the root of ensete they call it locally "ocha"-a rodent. Development workers also share the idea that this animal was the major limiting factor to the ensete cultivation in the area. Farmers must dig the soil very deep in to the ground often 5-6 meters in order to kill this animal, but, they do not usually succeed because this animal is naturally brilliant and can dig the soil with a speed better than what twenty peoples together can perform as it escapes in another underground hole.

Plate 8: A farmer in Akamer whose ensete plant has been eaten by a rodent



Photo By: The Researcher (January, 2009)

4.2.4. Lack of Agricultural Inputs

Agricultural inputs such as fertilizers, improved seeds, and pesticides were difficult for farmers in Ari to get them. As a result, farm productivity has been constrained and food insecurity has been pronounced.

The following table reveals that the majority of the households or fifty four farm households (90%) do not employ fertilizer in their agricultural practices. This was due to the lack of access to improved agricultural technology in the area. Almost all the farmers do not employ pesticides on their farmlands. Again the inaccessibility of improved agricultural inputs in the area has been reported by the farmers in Akamer. Almost all (98.3%) of the households do not employ pesticides. Only five farm households (8.3%) of the sampled sixty households had access to improved seed. Most of the farmers do not have access to the improved seeds as it can be seen from the table below. Few who have reported their use of improved seeds provided by the agriculture bureau alleged the price was expensive. The agriculture bureau in its part held limited interests by the farmers themselves and their lack of both the money and awareness on the importance of

employing improved seeds have been constraining farmers from producing beyond subsistence.

Based on the above facts, it can be argued that, the level of agricultural inputs available to farmers was very poor and their potential contribution to boosting productivity has been constrained. The lack of these viable farm inputs is likely to have been a major challenge to the Ari farmers.

Table 2: Farmers’ Use of Agricultural Inputs

Farmers Use of Agricultural Inputs	Types of Inputs								
	Fertilizer			Improved Seed			Pesticides		
	Yes	No	Total	Yes	No	Total	Yes	No	Total
Frequency	6	54	60	5	55	60	1	59	60
%	10	90	100	8.3	91.7	100	1.7	98.3	100

Source (Survey, 2009)

4.2.5. Inadequate Agricultural Extension Services

In addition to lack of agricultural inputs, the limited coverage of extension services was also mentioned to have inhibited the Ari from producing sufficient. The majority of them were not extension service users. This may appear because of lack of extension service delivery alone, but, it was considerably because of farmers’ lack of awareness on the relevance of it and also their capacity to implement what has been told and demonstrated to them by extension workers. Many of the problems Ari farmers face were attributable to their lack of education in one way or another.

Farmers show reluctance to listening to extension workers advices and sometimes suspect what is told to them was not for their advantage. This was a manifestation of their lack of education. Despite the role that can be played by extension services in promoting agricultural innovation, there seems no strong and more effective linkages between agricultural research institutes and farmers in the study area. The services provided were also inadequate. The linkages were mostly constrained by farmer’s inability to read extension materials among other things. Educated farmers, however, reported they have been better visited by development workers than those with no education. Development workers themselves have indicated that they feel comfortable when they work with

farmers with some sort of education than to work with illiterates. They have mentioned, nevertheless, there were farmers endowed with natural brilliance despite their lack of education.

Agricultural extension is needed whenever a need arise to increase productivity, to make farmer better aware of the activities they undertake and whenever there is a changing environment of production due to various reasons that affect the regular way of doing things. So doing requires consulting and collaborating with stakeholder to assess their needs and knowledge. If the goal of an extension program is to stimulate economic growth and hence, promote sustainable development, better use of technology and improving the know-how of farmers will be helpful.

Case 3: A success story of educated Farmer

Daniel is an innovative farmer who lives in northern Akamer bordering Arkinti. He is a young rich man of 29. He has a very small land compared to his neighboring farmers. But, he is better-off by his seventh grade formal education. Daniel is rich not only in his material abundance such as oxen, food reserve, and shop, but also, rich in a social sense since farmers in the area viewed him as a role model in many regards. His education is repeatedly mentioned being the main driver of his betterment economically and socially. He is also confident, whenever he speaks of his own special interaction with development workers, which he believes is the result of his betterment in education. Though his landholding size is the smallest compared to the farmers in the village, he is better off economically. His Neighbors say Daniel is the most wealthy and hardworking farmer. He himself has commented his education has contributed to his success in interacting with development workers and enabled him read extension and other materials relevant to his farm activity. As a result Daniel is personally exceptional in using extension services such as advices from experts, improved seeds, and trainings on how best to grow coffee, using fertilizers, etc. Daniel has done an experiment on his own farmland. He knows that in their folk tradition it is believed that the best time to sowing beans is July. He Observed, however, repeated crop failures in the last few years. As a result, in may 2008 he sow one "timad" of bean, and again in June 2008 he sow another one "timad" of bean. Since it is a tradition to sow bean in July, he sow three "timad" of bean this time. Based on the harvest, he observed that the amount he got from one "timad" of bean sown in May is equal to the harvest from three "timad" sown in July. Now, he decided to grow five "timad" of bean for the coming May 2009 growing season. Daniel has the reputation that the lunar calendar of the traditional Ari is being confused with the national calendar and that is disturbing the very wisdom in their folk tradition. He says for instance zeta is July, but, may not exactly fit in to the counting. As he said, unlike July, Zeta May begin or end early; since it is based on the movement of the moon than the counting of days.

4.2.6. Lack of Draught Animal

Oxen are very important means of production in many of the rural Ethiopia. The survey result shows that, the mean value of households' oxen possession is 0.8. Despite the basic shortage of oxen plough, a significant number of respondents (35%) do not have oxen at all. Farmers were asked if they could get oxen by rental and their responses shows that the majority (98.3%) of them could not get them. But, it was not because oxen have no role in their farm production; rather their own financial insecurity to rent oxen and also because of absence of oxen available for rent.¹⁰

4.2.7. Lack of Grazing Land and Veterinary Services

Though, the majority of the farmers in the study area practice livestock rearing as part of their agricultural livelihood strategy, only few possess reasonable number of livestock. The majority of the farmers surveyed indicated they were forced to own few cattle due to the small landholding size they have and the overall problem of communal grazing land. Despite problems of sufficient livestock due to lack of grazing land, the absence of veterinary services also provoked additional challenge to the economic well-being of farmers.

The survey result shows that, the mean value of livestock possession by households was generally insignificant. Livestock to household ratio was found out to be (0.8), (0.8), (0.8), (0.1), (0.1), (0.4), (2.1) and (0) for oxen, heifer, calf, horses, mules, goats, sheep and donkeys respectively.

This is an indication that the level of production of livestock was not enough to support households' food supply. Had it been improved, this sector could have strengthened crop production by providing oxen for plough, and manures for the soil fertility. Moreover, its better performance could have supported households' nutrition requirements.

¹⁰ According to the result of a survey made in Ethiopia by Ramachadran, (1997), the average harvest per oxen owning household was almost double than that of the non-oxen holding households

Plate 9: The Lack of Grazing Land



Photo By: The Researcher (January, 2009)

4.2.8. Absence of Financial Services and Limited off-farm Activities

Food may not be sufficiently produced for various reasons mentioned earlier. Alternative means of incomes are needed where a household can not afford its minimum subsistence requirements. As a result, rural households may need to involve in off-farm activities as part of their livelihood strategies, which in turn are expected to lessen the pressure on the viable natural resource such as land. Pity trade, selling labour, handicrafts etc, are some of the means through which rural households secure additional incomes. A survey on sampled sixty households indicated that, very few households were engaged in off-farm activities. This was because the majority of farmers do not have financial access and the skill with which to start these businesses.

Since the incomes of the Ari farmers were not certain due to the unreliability of the weather and unsustainability of their production practices, it is most likely that at times of crop failures and as the production of cereals decline, the farmers bear disastrous effects of food insecurity. In such situations of food deficit the most obvious reaction seems to buy grains to meet consumption requirements. The low income households, however, do not have money to buy food during drought years; consequently they seek credit. In some

cases, poor families with no additional source of income other than agriculture will have to sell or exchange livestock for grains. But the condition of livestock was also not hopeful as illustrated above.

"Rural incomes fluctuate from season to season in respect to weather shocks and related hazards. Due to the risks affecting income level and consumption, poor rural households in developing countries demand access to financial services to help stabilize income and alleviate food insecurity (Zeller, et al, 1997 in Kebede et al, 2002:63). Among the sampled sixty households, the overwhelming majority (96.7%) have no access to credit services. As Tesfaye 2007 noted, however, "if there is enough supply of food in the surrounding areas then cash transfers could be the most appropriate intervention that improves the trade or exchange entitlements of the affected people" (Tesfaye, 2007:14). Sadly, that seems impossible among the Ari where most of them have no access to credit. True as Kebede et al wrote "Limited access by rural households to financial services is widely recognized in Ethiopia" (2002:61).

Off-farm economic activities create employment opportunities in rural areas through enhancement of diversification of economic activities and reduction of risks. Therefore, engagement in off-farm economic activities is expected to have a direct relationship with improved income of farmers. This was not, however, the case in the study area where the majority of the farmers have no alternative means of income except crop production and subsidiary livestock rearing. The majority of households, fifty two of them (86.7 %) were not involved in any off-farm activities. This reveals the farmers high-level of vulnerability to shocks at times of crop failures and also the pressure that will be posed on the resource base of the local people as people pursue to do whatever with their natural resource endowments in order to survive.

To sum up, declining farm size, population growth, land degradation due to inappropriate use such as cultivation of steep slope and deforestation, recurrent drought caused by climate variability, weak agricultural extension services, unbalanced market relations, poor transport linkages, low level use of fertilizers, lack of improved seeds and pesticides, and backward technology were some of the major constraints to the Ari crop production.

Chapter Five: “Mounting Crops” and the Role of Market

5.1. “Mounting Crops”

These were crops whose production has been lately arrived to the highland areas of Akamer and Arkinti. Coffee, cardamon and maize were the three major crops recently introduced to the study area in Akamer. The production of these three crops has been restricted previously to the lowland and part of midland rural kebeles. The lowlanders were known by their quality and good yielding coffee, sorghum and maize. These three types of crops were not popular until recently in the highland areas. Currently, however, they enjoy significant amount of production priority and market value.

5.1.1. Coffee

Coffee (*coffee arabica*) is said to have been domesticated wild in Africa. It is the backbone of Ethiopian economy. It continues to support the livelihoods of millions of Ethiopian farmers. “No commodity has ever played a leading role in the Ethiopian economy as coffee” (MCTD, 1978, in Dange 2004: 18). Fifteen million people were engaged directly or indirectly in the production, processing and transporting of coffee in Ethiopia (Dange 2004, Befekadu and Berehnau 2000). It is this crop (buno), which was recently well introduced to the highlands of Ari whose previous production practice was mainly restricted to “tikam”, lowland and home consumption in contrast to its current expansion to “wonam”, highland and market.

According to the oral information received from farmers in Mester, where coffee was relatively older than the highland places, it used to grow wild in the forest and its propagation happen naturally. This was possible through seeds falling to the ground below the mother plants, or by dispersal of the seeds by other wild animals such as birds. Young plant propagated through this method grows under dense shade beneath the parent plant.

Plate 10: Right: Farmers Collecting coffee seeds from the ground, Left: Old Coffee forest Midland

Mester Area



Photo by: The Researcher (January, 2009)

Recently, however; farmers have begun cultivating coffee using selected seeds. They have begun selecting a suitable place and preparing land for its effective production. They clear trees and burn grasses in order to prepare a new coffee farmland. Some farmers have also begun preparing a special shade nursery place for seedlings under the supervision of development workers. Shadings are constructed from the locally available material such as bamboo tree. Vegetative propagation by cutting was also introduced to the area through extension education. Consequently, ensete territories were significantly invaded by coffee plantation. If it continues to expand as before, coffee is likely to win the battle field of “wonam” for land.

Harvesting usually takes place in November and February. It corresponds to the end of the rainy season of “bergi” which as of recent years extends to September and October. The harvesting usually ends before the beginning of the dry month January. In January, most of the Ari farmers do not work on their farmlands. Unlike previous times, the rainy season of Bergi, which usually lasts from June-August, now extended to September October and December which necessitates coffee harvesting to happen during rainy seasons. According to coffee buyers who have introduced coffee wash machines, harvesting during rainy seasons makes the coffee wash very difficult and reduces the quality of coffee.

Farmers were told by the development workers, that they should pick the fruits when they have reached optimum maturity i.e., when their colour becomes red. Unfortunately, a poor harvesting practice has been on the increase as development workers in the area noted. They say farmers' practice harvesting before the fruits are fully mature; meaning when they are either yellow or dark brown. At the stage of prematurity, when farmers undertake harvesting, the cherry was still green, the seeds were insufficiently developed and under-weight. Chemical component of coffee, which gives coffee its natural flavor, is not yet developed. Its effect on quality of the beverage was, therefore, very significant. Most farmers in Ari, until very recently, were collecting coffee seeds after it was dropped on the ground by the wind or they wait until the coffee beans get drier and detach from their mother tree; the worst of its kind as it affects quality of the beverage.

The Ari consume coffee at home at least three-four times a day. They usually prepare a coffee drink from its leaf than from its grain. The coffee leaf is boiled with water and ginger. Cradmon, onion, salt is also added in order to give it a special flavor cherished among the Ari. In earlier times, the seeds were usually consumed for ritual purposes such as gifts for godmi. The Ari offer the godmi coffee seeds with a black or white sheep whenever they need rain or sunlight in their farm activities.

Ari Farmers today value its market price than anything. Consequently, it has become the dominant cash crop in the local market. And hence, today most of the Ari grow coffee as means of additional income beside growing food crops such as sorghum, barely and maize. As opposed to previous times, the production of Ari becomes market oriented than domestic consumption; since coffee production increased its volume. The amount and magnitude of coffee grown and sold on the market has also increased from time to time. There were also farmers whose sheer holding of land was being covered by coffee tree.

For the overwhelming majority of the households, the practice of producing coffee generally begun in the last twenty years. Out of the fifty four households who have already begun producing coffee, forty seven households (87%) have begun growing it in the last twenty years. From these households again, significant number of them or twenty nine households (53.7%) has introduced coffee to their respective farmlands in the latest five to nine years. Farmers reported various reasons have motivated them begun and

subsequently expand the production of coffee. Forty five (84.9%) of the households mentioned the value of coffee in the local market has encouraged them grow coffee. The role of development workers in encouraging, advising and educating farmers to expand coffee as rated by households was inadequate and it was only represented by twelve farm households (22.6%). However, as regarded by forty six households (86.8%), farmers who succeeded in their life as a result of coffee production were an important source of encouragement for them to begun growing coffee. This was an indication that a price alone was not enough to make farmers decide to introduce new crop to their production practices; instead they need to discover from people who succeeded in their attempts to grow those crops. While thirteen farm households (24.5%) commented that their lost confidence in other crops they grow has brought encouragement to their decisions to introduce coffee for the first time into their farmlands, twenty eight of them (52.8%) alleged coffee's ease to growing was a source of their encouragement behind its expansion. During focus group discussions and also in the survey questionnaire, where an emphasis was given to climate related questions, farmers indicated the very important aspect of the change in the production practices to be the changing agro-ecology which creates a favorable atmosphere for coffee plant.

Coffee expansion into the formerly cold highlands was attributable to climatic conditions as framers and development in the area indicated. They mention a case in which the lowland coffee has decreased yield and also quality; explained in terms of the coffee ripe seed in a single seed coat/parchment used to give two coffee seeds, but, today one dies during embryonic stage and only one reaches its maturity with poor/low quality. Consequently, the coffee from lowlands receives low market value while highland farmers begun to receive better price on the local market. This was evident when farmers of the lowlands have to travel first to the highland areas and then through the highland routes taking them to the market, so, to appear as if they have brought to market a coffee from the highlands.

Plate 11: A Three Years Old Coffee in Northern Akamer Bordering Arkinti, Coffee and Ensete in the Battle Field of "Tikam"



Photo by: The Researcher (January, 2009)

According to Cambrony, there are areas where coffee can possibly grow or not. In areas where it can possibly grow for ecological factors but historically missing, it might be introduced and easily be adopted. Cambrony (1992:1) stated, "the development of coffee cultivation has been unstoppable in all areas where it is ecologically possible and economically advantageous to grow it." This exactly goes in line with what is observed in the Ari these days; which means, both the ecological and economic factors were contributing their suitability for coffee production.

The price of coffee which was ever attractive on the local market has a positive implication on the incomes of households. There were improvements in the living standards of farmers whose volume of coffee production is high. The improvements were explained in terms of the kind of house they own, such as iron roofed and the nature of their compounds (how fenced their compounds were). Again few have bought pair of oxen which was unthinkable before they begun growing coffee.

The transition of farming system from the previously subsistence dominated to the current mixture of cash and cereal was not, however, without drawbacks. As it was identified during focus group discussions, the condition of women and children in most

of households is worsening. This was because, as production becomes highly market targeted, the household level entitlement situation compared to the previous times during when cereal production was dominant both at the village and household level gradually altered. Men household heads have exclusive power and control over coffee production. They were also the men, who took the product to the market every time a coffee is mature. This is true as Gebre (19195:23) indicated, among the Ari, "the authority structure may be described as patriarchal since greater power is vested in the male head of the household. It is the father or the husband who provides leadership and who decides on major family matters." Still women have relative control over cereals such as maize, barely, sorghum etc, but since the volume of production of these crops declined overtime, the entitlement situation of food within the households has become tough.

Case 4: Household Level Entitlement Problem: A Gender and Age Perspective

Mesiyo Gaimshi is a woman who lives in Southern Akamer. She has got six children of her own. She is the second wife "keshten" of her husband who has got three wives including the "toydimu": the senior wife. Her husband has got around 13 children from his three wives. He is the one who controls, administers and distributes every asset among the three female headed households to which he is a chief. Her husband has nearly four "timad" of coffee which is roughly equivalent to half a hectare. Beside coffee, they grow maize, sorghum and wheat. In 2008 summer, when drought damages their maize cultivation, they were forced to buy food from market. A kilo of maize was sold by then for ten birr on the local market at Mester. It was a difficult time for her and her family to survive. Because coffee was not ready for harvest and her husband didn't saved money from the previous harvest, they were in a serious shortage of food at home. As a result, she was forced to sell her lonely cow from which she used to obtain milk for her children.

5.1.2. Maize

Unlike sorghum, whose origin is repeatedly tress back some where some time in Africa, maize (*zea mays*) is said to have been introduced to Africa from the Americans by Portuguese colonialists in 16th and 17th C. It was during the same centuries that this crop was first introduced to Ethiopia by the Portuguese. As a result, it was called "colonial crop" not necessarily because it has been brought to Africa with colonialism, but, rather it has also dominated domestic African cereals similarly as colonialists did to native Africans. In the Ethiopian Nutrition Institute (1975), it was stated that, maize is an American crop.

The fact that maize (fatri) like tef has no place in the ritual life of the people seems basically because of its origin. Its importance has been restricted to diet and market. Compared to the production of sorghum, the people preferred it for its ease in production processes and also its marketed value. With regard to productivity, however, it was usually looked down from sorghum's point of view. Most of the Ari farmers prefer maize over other crops they grow such as sorghum, for its suitability to be made food in various types. As a result, it was commonly consumed in the daily diet of the Ari from edible to drinkable.

Maize is sown twice a year both during "bergi" summer and "Sila" spring. Its cultivation also requires heavy work, but, not as heavy work as sorghum requires. First, land is cleared. Then, soil is softened through frequent oxen plough. After it is sown, repeated weeding follows.

For maize cultivated during summer, field is usually prepared during June and July. It is sown in August and harvesting usually takes place in December. Among the Ari, December is a time of harvest for bergi crops (summer crops) and a field preparation for sila crops (spring crops).

Land is usually prepared in January and February for a maize cultivated during Sila (spring) season. It is sown in February and March. The harvesting takes place in august. During "sila" as framers commented, maize gives poor yield due to drought.

Maize consumption begins at an early stage before the seeds are fully matured. At the early stage, it can be made food after it has been roasted on the glowing fire. This is a seasonal food possible only at early stage of maize harvest. It is also toasted strongly on a pan. This food is usually served as a snack. Maize, both the fresh and the dry one can be made food after being cooked in a pot for a couple of hours. Among the Ari, maize was usually adored for its porridge. In order to prepare this food, maize is first lightly toasted and made in to powder. The powder is then made into porridge. The porridge is usually served with butter, food oil, or pepper powder. Maize is also made food, as a bread, or 'injera'. These food types were not common among the Ari. 'Gola' the most esteemed local beer among the Ari is often made from maize.

In previous times, its production like sorghum has been concentrated in the lowland and midland areas. As of recent years, however, it has begun to expand to the highland areas where it has never been grown. It is also one among the crops grown in the area which has received much of the attention of development workers and extension services. It is however, indicated in literature that maize and wheat are less drought tolerant compared to sorghum which is better adapted to semi-arid conditions than both. "Complete failures due to limited rainfall are less frequent than for either of the latter two crops under the same conditions" (Ashley, 1999:27). Unlike maize, this drought tolerance of sorghum is attributed to its extensive rooting system among the many other qualities it possesses in adapting to harsh climate.

Case 5: Framers' decision to grow sorghum when maize cultivation failed due to drought

In 2007 growing season, we had grown maize. Due to dangerous heating of the sun light and absence of rain, it was all lost in the ground. The next growing season most of us decided to turn back to sorghum whose production we have minimized few years ago. (Reported by Framers in Akamer during focus group discussions and informal interviews)

Like coffee, the production of maize was also a recent phenomenon for the majority of households in the study area of Akamer. From the fifty five households who have already begun growing maize, forty five households (81.8%) reported they have begun producing maize in the last twenty years. From these households twenty six of them (47.3%) have begun producing maize for the first time in the latest nine years.

Plate 12: Maize Cultivation Introduced to North Akamer Bordering Arkinsi



Photo By: The Researcher (January, 2009)

The price of maize, which was attractive on the local market as reported by thirty five households (68.6%), corresponds to their motives to grow maize. Maize's ease to grow compared to other crops such as sorghum could be responsible for its rapid expansion as represented by twenty four households (49%). Thirty three farm households (67.3%) also appreciate its yield potential as the major drive behind its expansion. Despite the extension priority it receives from development workers in the area and also by the Woreda Bureau of Agriculture as part of the food security strategy of the area, the contribution of improved seed provision in expanding the production of maize was only mentioned by five (10.2 %) households. This was due to the limited coverage of extension service in the area and also the high price of the seeds which was not encouraging as framers have stated during discussions. Maize production expansion due to lost confidence on crops grown before was stated by eleven (22.4%) of the households. Since maize is drought sensitive compared to other crops grown by Ari farmers, its expansion will have a negative consequence to the food security at times of crop failure. Except for its risk associated with bad weather, however, maize is obviously a high

yielding crop since it receives high level of attention and investment in agricultural science and research.¹

5.1.3. Cradmon

The Ari have become Cardamon growers in less than a century ago. During earlier times some 50 to 70 years ago, its production has been confined to the land of few households and its use was also domestic than market (Gebre, 1995). The author further noted that some twenty to twenty-five years ago, the Ari framers had begun to clearing land on which they grow 'tikam' crops such as ensete and other root crops.

In previous times, the Ari used cradmon as a spice in their food intakes and not every framer used to grow it. Most of the farmlands currently covered with this crop were formerly covered with ensete. It is after they cleared the esnsete that farmers often grow cradmon.

Plate 13: Cradmon Cultivated where formerly Ensete was Grown-Akamer



Photo By: The Researcher (January, 2009)

¹ In situations where irrigation is absent and weather is becoming unreliable, it is not advisable to substitute maize (which is drought sensitive) by tef (drought tolerant) (Seyefu, 1989). He further argued Maize's potential to boost productivity in areas where irrigation is possible and weather is relatively stable.

Nowadays, most of the Ari in the midland and part of highland area have begun widely growing cardamom for its highest market value in the local market. A kilo of cardamon was sold for 40 ETB at Mester in March 2009 (28/07/2001 E.C.), while its price in Addis was 50 ETB in the same month. Beside its high price on the market, cardamom was preferred for various reasons. These includes, it's regular harvesting, its self-propagation and rapid expansion, the ease to growing it in almost every environmental condition from swamps to open fields, rivers, banks and forests. Nevertheless, farmers currently grow it for one very reason-that is for its high market price.

Gebre's study some fourteen years ago, when the Ari people were changing the crops they grow from predominantly subsistence to cash, they had a belief that they could get food crops from the surrounding area such as Maale. Practically yet, they were uncertain about what might happen to crops anywhere else and including their own as the weather becomes ever unreliable and repeated crop failure was recorded. Their belief that they could buy food with the money they receive from selling cash crops was also doubtful since it was proved in 2007/8 production season when they were unable to get food on the market even when they had the money with which to purchase food grains. According to an expert in the Woreda Agriculture Bureau some 20 years ago, food shortage was phenomenal. But during that time, it was not from Maale that food was obtained rather it was transported all the way from other place in Arsi to the Ari land. A year ago, in 2007/8 production seasons, the same problem was faced by the Ari framers and a kilo of maize was sold for ten birr in the local market: Mester. This was due to the limited supply of the grain from the surrounding areas which necessitated farmers to compete for the available, yet very little grain on the local market. Few framers, who abundantly grow cradmon still allege that this crop has raised their living standards.

Plate 14: A man in his Cradmon Farm



Among the crops I grow, it is cradmon which makes me feel I'm truly a man. Look at my home, it is covered with iron roof. Look at me, though I'm old, I look a young man of twenties. My life has been improved because of it. Its price is the highest on the market. A man who takes it to the market should feel honored as it is not "gola" but cradmon that he brought to the market, which every merchant wants to make it his own.

Photo By: The Researcher (January, 2009)

5.2. The Role of Market and Infrastructural Development

The Ari sedentary farmers have been subsistence oriented who primarily produce for home consumption than marketing purposes. Due to absence of transportation facilities, most of them have been unable to get good market prices for their products. Their movements from one place to another in search of market opportunities have been constrained due to lack of infrastructure, specially roads and transportation networks. As a result, farmers were unjustly exploited by merchants and some middle-men who were able to buy farm products with little price and negotiation. Even when they produce cash crops, their market relations with intermediaries have been inequitable. They were often obliged to sell low and buy high, with little choice regarding where they conduct transactions, with whom, and at what price. "Merchants buy crops at lower prices, while charging farmers high prices for imported commodities" (Gebre, 1995:119).

In the last five years, however, Mester has developed in to an important rural market center with a large rural hinterland. Nowadays, it has flourishing market providing food and non-food products for its own inhabitants and for people from surrounding villages. The small and young town Mester has begun to play a crucial role in facilitating the urban-rural exchanges in the area. Beside the market opportunity, it offers to the

surrounding rural kebeles, facilities such as; weekly markets, shops, recreations, schools and health clinics were provided.

Plate 15: A market Overview of Mester



Photo By: The Researcher (January, 2009)

The development of Mester town in the last five years into a small coffee market center may be seen in this regard as a driving force behind the spread of coffee plantation into the highlands; beside the influence from the weather and other production related factors. The town on the other hand seems rapidly expanding due to the commercialization of production in the area. As most households indicate, the high price of coffee in the local market has encouraged them to expand coffee cultivation. The majority of farmers have become market reliant in their decisions to grow particular crops whether that is a food or cash crop. Thirty four households (57.6) have commented their decisions to grow crops were made based on market price consideration. Zodang wrote, "the market is considered to form the pillar of economic life, and rural centers are progressively organized around the market and its related commercial activities" (Zodang, in Bruijn, 2005:170).

Farmers were asked, what might have motivated them to introduce new crop into their production practices. They mentioned the price of coffee and cradmon on the local market which was certainly the highest among the crops they grow. It is worth to mention

that the highest market value of a kilo of Cradmon in the local market which was 35-45 ETB during the field work of this research might have been an encouragement to farmers who grow it.

For the agricultural sector to achieve its potential, investment in infrastructure is needed. When infrastructure is developed usually the 'hard' ones such as road, it will bring with it the 'softer' ones such as credit, extension, transportation, communication etc and hence will bring about effective links between the rural and the urban economy through prompting better market opportunities and nobilities. However, weak rural-urban linkages have largely constrained rural development in the remotest parts of the world. A country such as Ethiopia suffers most from absence of infrastructure that facilitates market opportunities and hence triggers economic development.²

In the last five years, Mester begun to flourish. In 2003 construction of a gravel road begun and when it was finished in 2007, Mester has found itself at an intersection of major route which connects Jinka with other neighboring towns. This has proved a great stimulus for trade. Traffic has not only become more efficient, also products from other places were available at various markets and many of the surrounding farmers have found opportunities to sell their products and buy thereby. "Investment in infrastructure, particularly during the early stage of development, is of crucial importance as it sets the framework for subsequent investment by both private and public sectors" (Todaro, 2005:536). As Ari farmers indicated, the construction of the road has stimulated their economic activities in such a way that it has created better access to transportation services which in turn has accelerated market opportunities.

² Agricultural Trade and transportation forms a very important aspect of the food security equation. (Ramachandran, 1997:9)

Moreover, the majority of households surveyed commented that the newly constructed road has supported them in time and energy saving, through creation of market possibilities and price betterment of their products, helped them send their children to better schools such as to Gazer and Jinka, enabled them get better health services at the near by towns.³

As the majority of them believed, since market is what motivated them to introduce and expand new crops in to their farmlands, infrastructural development such as the construction of the road has given them further hope and encouragement in producing for market.

Though the Ari farmers were gradually becoming cash crop producers, there were still factors constrained them from fully engaged in the market. It was only the physical dimension of the market which seems partially fulfilled; the physical access to the market due to the road network which was recently built. The structure of the market; in which few merchants alone regulate market prices was never changed. At times of crop failure the price food grains on the market becomes high. This time, many of the households will be forced to buy from the market with unreasonable and perhaps unaffordable price. In 2007/8 production season when the production of maize was failed due to drought, a kilo of maize was sold for ten ETB in the local market. Beside shortage of supply of food grain on the market, it was further aggravated by the lack of market price regulation. Hence, merchants who bring the grains from other places charge big prices while government failed to provide food aid. The food security of the Ari framers, therefore, can be associated with market relations. Market plays a significant role in determining the access to food.

Moreover, farmers' lack of skills and information remained unchallenged. The very structure of the market which has forced large number of farmers, dependant on few market mediators continue to be a challenge to destitute farmers who have little choice to refuse the offer presented to them by those few merchants. This has made farmers

³ Transport constitutes one of the necessary inputs for rural development and has been viewed as positive stimulus to growth in food production and overall commercialization. Its expansion has been associated with increases in the marketable surplus, areas under cultivation, rural incomes and better terms of trade for the agricultural sector. (Mekonnen, 1989: 458)

uncompetitive and the market highly inequitable. This circumstance was further aggravated as traders continue to consider themselves as market price regulators and the only source of market information.

Chapter Six: Summary and Conclusions

6.1. Summary

Mixed agriculture: crop production with marginal livestock rearing was the major economic activity in the study area of Akamer and Arkinti. While crop production dominates the farming system of the Ari sedentary farmers, livestock plays a minor role both in their daily routines and in their livelihoods in general. The main crop types grown in the study area were sorghum, maize, wheat, barely, ensete, coffee, cradmon, pea and bean. The livestock production in the area mainly involves keeping animals such as oxen, cows, sheep, goats, donkeys, mules and horses. However, as it was identified during a household survey, the livestock production was inadequate to be called an alternative means of livelihood; since the majority of the households own single ox, one cow, two sheep, three goats or not at all. Moreover, due to lack of grazing land and veterinary services, the fortune of this sector to serve as an alternative source of livelihood for Ari seems discouraging.

Crop production practices of Ari have underwent significant changes in the last couple of decades. The major changes observed were declining of yield of some crops such as, sorghum and ensete in the lowlands and expansion of crops to highland areas. Crops such as coffee, cradmon and maize were pretty well introduced to the highlands of Akamer and Arkinti. The production of tef, which was common both in the lowland and midland areas of Ari, had been ceased. Repeated failures of crops such as barely, pea and bean had occurred in the highland Arkinti in the latest past four years. The production of maize, even though it was a recent phenomenon in the midland areas, due to weather changes, its yield had declined and complete failure was encountered by farmers producing it. Coffee and cradmon production have, however, increased both in the volume and magnitude in to the highlands.

Below a table is used to summarize what has been written so far. This table is adapted from (Shigeta 1991). In the table, Shigeta tried to show the importance of crops grown by the Ari people some twenty years ago. In doing so, he referred to the three agro

ecological zones. The current researcher used it as a tool for comparison; the situation of today with the then. Some crops were deliberately omitted from the list and the column referring to today were added.

Table: 3 cultivated plants of the Ari and their Importance Today and Some Twenty Years Ago

No	English Name	Ari Vernacular name	Species	Importance in the Area					
				Under 1200m		Between 1200-1800		Over 1800	
				Since 1990s	Today	Since 1990s	Today	Since 1990s	Today
1.	Ensete	Aqami	Ensete Ventricosum	+	-	++	+	+	++
2.	Barely	Gos	Hordeum Vulgare	-	-	+	-	++	++
3.	Wheat	Zergi	Triticum aestivum	-	-	+	-	+	++
4.	Tef	Gachi	Eragrostis tef	-	-	++	-	+	-
5.	Sorghum	Rubi	Sorghum bicolor	++	+	+	+	-	-
6.	Maize	Pater	Zea mays	+	+	+	++	n	-
7.	Bean	Wooka	Phaseorus vulgaris	+	-	+	-	n	++
8.	Pea	Ringa	Pisum sativum	-	-	+	-	++	++
9.	coffee	Buna	Coffea Arabica	++	+	+	++	n	-
10.	Cardamon	Kororima		NI	+	NI	++	NI	+

Source (Shigeta, 1991)

LEGEND

++: Very Common

+: Common

-: Rare

n: Very rare

NI: Not indicated in the previous study

Based on the above table and previous discussions, the following observations were made:

- The production of ensete was declining in the lowland and midland areas while its production in the highlands was as usual. Its consequence on the food security of the people, the diet culture and ritual life of the people needs further detailed study.
- The productivity of Barely and wheat was declining in the midland areas while it was common as usual in the highlands.
- The production of tef which was common in the highlands and very common in the midland areas was completely given up except on very rare instances.
- Sorghum which was very common in the lowlands and commonly grown in the midlands was declining in its yield while its production was recently introduced into the highlands. Here two types of sorghum were at least worth to mention. The "white" and the "red". The red sorghum was previously common in the midland areas while the white Sorghum was restricted mainly in the lowlands. Now a day as the white sorghum expand to the midland areas, red sorghum begun retreating to the previously cold highlands of the barely territory.
- The production of maize formerly common in the lowlands and part of the midland areas was pretty well introduced to the highlands.
- The production of pea and bean crops has shown little change in the altitude they grows but discussion with farmers reveals that repeated failure was recorded with regard to these crops and their production has been minimized in areas they were popular.
- Coffee production was declined in the lowlands where it was formerly popular and instead widely distributed throughout much of the midland and part of the highland areas.
- Cradmon whose neither production nor importance has been mentioned in the previous study by Shigeta gradually becomes more popular in lowland and midland areas. Gebre (1995), however, mentioned in his study of the Ari

production practices that the Ari begun growing it some 50 to 70 years ago. However, the current study identified it was first introduced to Akamer area some fifteen years ago.

Therefore, the major findings of this research clearly indicate that the changes in the Ari production practices were highly related to climate change, which can be explained in terms of internal variability of rainfall and an increasing trend of temperature as the meteorological record of some twenty to thirty years revealed. Climate change, beside farmers' opinion and scientific evidence obtained from meteorological records, was reported to have caused repeated crop failures and yield decline in the study area as the empirical evidence from CSA revealed. The changing weather has brought the shift in the agro-ecology of the midlands and highlands of Akamer and Arkinti which were formerly known to be very cold places not suitable for the production of crops such as coffee and maize.

Further factor identified behind the shift in the production practices of the Ari was the price of cash crops both coffee and cradmon which according to the majority of farmers' opinion is ever attractive. Maize they said, has also moderate market demand compared to the rest of cereals produced by the Ari. And hence, market a major factor behind the expansion of coffee, maize and cradmon in to the highlands of Arkinti and Akamer.

The construction of a gravel road which connects Jinka-Gazer-Mester-Tolata in the last five years which was compounded by rapid emergence of Mester town in to a coffee market was mentioned by development workers and farmers in the study areas to have been a major source of encouragement behind coffee and cradmon cultivation expansion. The road has stimulated permanent market access adjacent to the coffee producing rural kebeles. This can be looked against the fact that coffee production for (53.7 %) of the sampled households have begun in the last five to nine years, Metser has become a coffee market officially in 2006, and two coffee wash machines were also established in the last eight years.

Regarding food situation, as food grains continue to decline due to the interrelated factors such as the expansion of cash crops, the reduction of soil fertility, weather variability, plant disease, birds attack, absence of meaningful extension services, lack of credit

services, lack of grazing land, absence of veterinary services, lack of oxen, etc, farmers' food security have been gradually eroded. This is further aggravated by "entitlement failures" within the households themselves as women and children of Ari become inferior and forced to live by the mercy of husbands who usually administers more than one wives and also who predominantly controls and distributes cash crops among households to which they are chiefs.

The rather low level of income earned by farmers in the study area has also obvious implications to the situation of food security of households. The low level of income of farm households was a result of the small land holding size and the low productivity of agriculture in general resulted from lack of appropriate technology, extension services, erratic climate, absence of credit, lack of sufficient knowledge and skill by farmers among the many other constraints to their farming systems.

As a result of all these challenges and their shocking consequences, that the Ari farmers have encountered alone, nobody in the study area considers government as a possible source of relief at times of need. Food aid was not given when they were suffering from food shortages. NGO projects were not heard. It seems to be an area where the state and development have little influence if not at all.

To sum up, the Ari sedentary agriculturalists were small scale subsistence farmers. They were mostly engaged in consumption oriented agricultural production. They have no sufficient landholdings. They have no direct access to credit. Their information on market and other agricultural related developments were blurred due to lack of appropriate technology and infrastructure. Moreover, their high level of illiteracy (70.6%) was likely to bring any hope they have on anything into nothing.

6.2. Conclusion

Today, rural households of Ari face complicated challenges. Farmers were losing access to the key agricultural inputs and viable natural resources due to both natural and man made hazards. Climate change with increasing population density was augmenting pressure on an already fragile natural resource base that was the mainstay of their livelihoods.

Since climate change was the major limiting factor of agriculture in the area, sustainable use and conservation of natural resources such as forest and soil conservation need to be prompted and should be given priority among local government's endeavor to improving the Ari economy. Irrigation was also possible even though terrain is difficult and rivers shrink during winter season. With the existing technology and human skills, however, farmers were not able to use them at times of drought. Thus, irrigation technologies and skills should be given attention in order to save the Ari agriculture before its' complete breakdown. Timely warnings and information on weather conditions should also be provided if farmers have to make informed decisions in their production practices.

Agricultural production, unless it is supported by agricultural inputs such as pesticides, fertilizers and improved seed varieties, alone can not achieve productivity. It was the use of these viable inputs of agriculture that have insured boost in productivity during the green revolution in 1970s in Asia. But, it should be noted here that these inputs can still be made available by educating farmers to use organic products from local resources which are environment friendly, sustainable and cost effective. Limited extension services and insufficient agricultural input supplies were, however, other major limiting factors constrained the Ari farmers from producing enough for consumption and excess for market. Therefore, any attempt geared towards improving the productivity of the Ari agriculture must consider these facts and accordingly act in such a way they could be solved or reduced.

Lack of education (illiteracy) beside lack of sufficient extension services and agricultural input supply was what constrained farmers from appropriately and wisely using the available services such as selected seeds of maize, advices on coffee cuttings, on field demonstrations of coffee seedlings, etc. Farmers' mistrust of development workers was

highly attributable to their lack of education both formal and informal. And hence, mass education of farmers through extension geared towards solving their practical problems is important to boost productivity and insure food security.

The Ari farmers have recognized the market values of some crops important on the local market. As a result, they have gradually expanded those crops on their farmlands on which they used to grow food grains in the previous times. Cash crops such as cradamon and coffee have gradually replaced food crops such as sorghum, ensete, barely and wheat. But their limited landholdings, growing population, unsustainable use of natural resources, backward technology coupled with their limited information of the market were all actual and potential limits to their agricultural activities. Therefore, farmers need to be informed timely on how the market works and what they should do in order to become champions of market competition. Moreover, their land use and management needs to be improved if they have to produce for consumption as well as for market. If not, they will be in a grave problem of food security as they switch in between.

Further strengthening market should, therefore, be the core for a better and healthy agricultural economy. But, that can not happen in its won. It will rather depend on improved physical access and reduced transaction costs. Therefore, appropriate infrastructure and better transport services are needed. Failures to invest in infrastructure, however, will have significant impact in undermining productivity.¹ Moreover, when it is compounded with further failures to invest in natural capital and human capital, the consequences might disrupt the overall economic base of the poor.

The existing market structure beside the need to improve its infrastructure needs to be structurally shaped. This is because; small producers have always been disadvantaged in the market place. They trade in small volumes, low quality and based on little or no market information at all. Therefore, they will need to organize themselves to defend their interests and benefit from market opportunities. In the absence of an organization that defends their interests in the market sphere, farmers remain subsistent and also their efforts to engage in off-farm income generating activities would not be successful.

¹ The poor level of development of roads has been one of the major constraints on agricultural development in Ethiopia. (ILO, 1982 in Mekonnen, 1989)

Infrastructure, particularly road construction, which according to informants has improved their market accesses and health and education opportunities, was an important source of encouragement for farmers in the study area behind their efforts to producing for cash. Such developments in infrastructure should expand further in order to meaningfully transform the lives of destitute farmers in the remotest part Ari.

Much of the failure in the Ari agriculture to achieve its potential was, therefore, institutional. Support by both the government and other non-governmental institutions have been indifferent to the needs of the poor in the sector. Public institutions need to be strengthened so that they will be able to develop the skills, and the capacity with which to respond to the needs of the poor farmers. A major challenge, particularly in the agricultural extension and research service was the capacity of the institutions themselves to deliver appropriate and timely responses.

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Appendices

Appendix A: Plates

Appendix Plate 1: Barely Filled in Highland Arkinti



Appendix Plate2: A Four Years Old Coffee in Northern Akamer Bordering Arkinti



Appendix Plate 3: Left: A man who claim to have introduced cradmon for the first time to Akamer.
 Right up: cradmon on a farm under a shade where ensete was formerly grown , Right bottom:

cradmon along a river bank



Appendix Plate 4: Left Up: coffee plant regenerated after being cut, left bottom: old coffee tree, Right:
 Werelko Ezimi a man who allowed development workers to undertake field demonstration of coffee
 cutting on his own coffee farm



Appendix Plate 5: Crop Godmi: Godimso Dakimas Anigir at the place of public gathering in front of the Chilshi Compound at Arfes



I'm the father of every one in Sida including the Baabi. I'm working with people. Whenever they starve the people come to me. The Baabi won't do any thing unless he talks to me. If the people say something happened to them I must respond first. I'm the father of all. Crop Godmi/ Arfes 08/05/2001 E.C.

Appendix Plate 6: Baabi Frew Bamay and Godmi Amenack Bocho



Appendix Plate 7: Focused Group Discussion at Southern Akamer



Appendix Plate 8: Focus Group Discussions at Arkinti



Appendix Plate 9: Development workers and local administrators



Appendix Plate 10: Amusement with "tej" During market day at Mester



Appendix Plate 11: Ari farmers with traditional farm tools: Gosha-Hand-hoe, Boila-Digging Stick, and

Wali-Sickle



Appendix Plate 12: Boila-Digging Stick and Wali-Sickle



Appendix Plate 13: The Study Area



Appendix Plate 14: Traditional Ari Dance



Appendix Plate 15: Mester Town a View From Artes



Appendix Plate 16: Maki River Adjacent to Mester Town



Appendix Plate 17: Varieties of Ari Ensete Food with Drink Prepared From Coffee Leaf



Appendix Plate 18: Some of the Key Informants: Left Yijais Geni, Left top Seqsi Gara and his wives, left bottom: Baabi Frew Bamay seating over the sacred stone of Power transfer at the baabi shrine at

Arki



Appendix Plate 19: Deforestation-Denaturalization

Shangama Bili



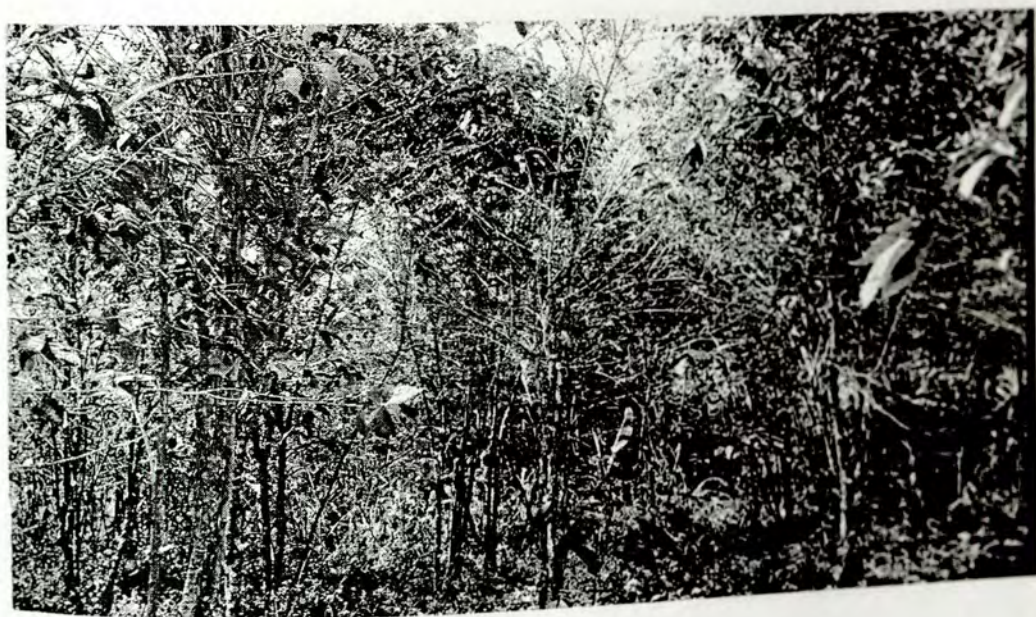
Appendix Plate 20: Fire Wood Transported To Gazer Town From Protected Forest at Shangama Bili



Appendix Plate 21: Focus group discussions-Central Akamer



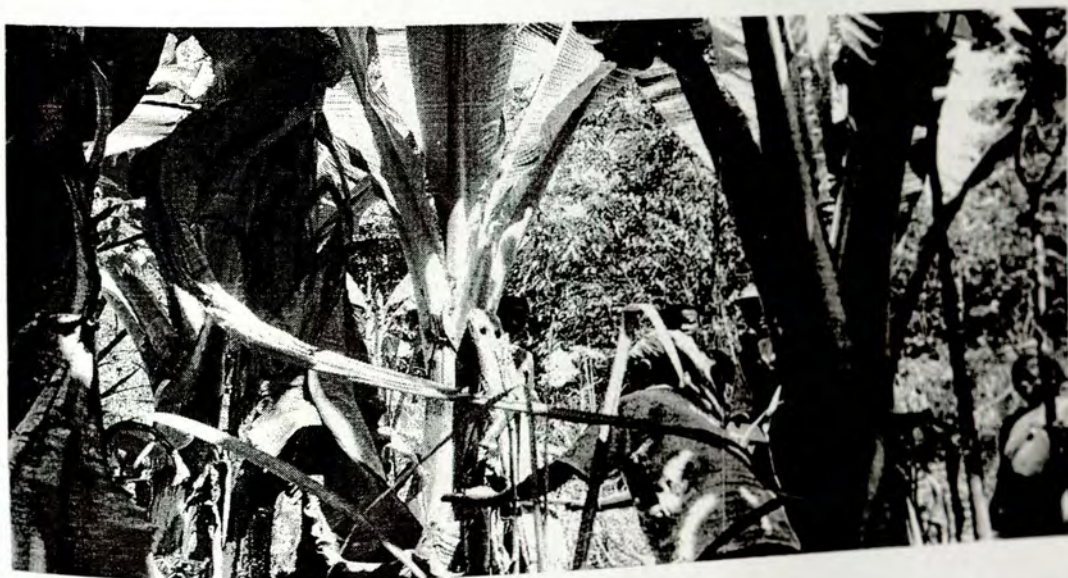
Appendix Plate 22: Coffee Expanded to Wonam-Arfes



Appendix Plate 23: Sacred Place of Chilshi-Artes



Appendix Plate 24: Ensete Food Preparation Begins at Field



Appendix B: Household Survey Questionnaire

Section 1: Household Information

Kebele _____, Sub Kebele _____ Name of _____
 Household head _____ Sex: ☐ Male ☐ female
 Household Size _____

Please give the details below

No	Name	Sex	Age	Relation to head	Level of Education	Occupation
1.						
2.						
3.						
4.						
etc						

Codes for the above table

Education		Occupation		Relation	
Level of education	Code	Type of occupation	Code	Relation to household head	Code
Illiterate	1	Farming	1	Wife	1
Read and write	2	Trade	2	Husband	2
Grade 1-4	3	Hand craft	3	Son	3
Grade 5-6	4	Black smith	4	Daughter	4
Grade 7-8	5	Other	5	Close relative	5
Grade 9-10	6		6	Dependant	6
Grade 11-12	7		7	Hired worker	7
12+1	8		8	Other	8
12+2	9		9		9
Diploma/certificate	10		10		10
Other specify	11		11		11

Section 2: Market and Marketing Information

Do you consider market in your production?

☐ Yes ☐ No

If yes, where do you get market information?

- ☐ From Radio
- ☐ From a development workers
- ☐ By asking educated people
- ☐ Through making a phone call to a relative living in urban areas

Other mention _____

Who decides on the price of the commodity you sell?

- | | |
|-------------------------------------|--|
| ☐ I my self | ☐ I negotiate with the trader |
| ☐ The trader | ☐ Government |

Section: 3 Infrastructure and Networks

Do you take a bus or any other car for transportation?

☐ Yes ☐ No

If yes, for what purposes? (Multiple answers are possible)

- ☐ To take a patient to hospital
- ☐ To look for better market for my products
- ☐ To visit my relatives
- ☐ For recreation
- ☐ To go to a court for a legal case

In what way does the road which is built to connect Mester with Jinka support your farm productivity? (Multiple answers are possible)

- ☐ It helps me save time
- ☐ It helps me save energy
- ☐ It creates a new market possibility
- ☐ It helps me get information easily

☐ It helps me diversify my income

☐ It helps me increase the price of my product on the market

☐ It helps me send my children to school

☐ It helps me get better health services

Others, specify _____

Section 4: Agricultural Land Management

Please tell us what type of land management practices are commonly used to improve soil fertility of land in the past in your area? (Multiple answers are possible)

☐ Application of manure

☐ Mixed Cropping

☐ Terracing

☐ Fallowing

☐ Tree planting

☐ Crop rotation

Other specify _____

From where do you get this knowledge?

☐ Acquired it by my own

☐ Got it from my parents

☐ From Development Agents

☐ Given training from NGOs

Others _____

Did you use irrigation on any of your farm land in the last one year?

☐ Yes

☐ No

Section 5: Agricultural Inputs

Please give details on the use of improved agricultural inputs in the last 2000/1-
production season

Type of input used	Amount used in kg	Total value in birr	Methods of payment	
			On credit	In cash
Fertilizer				
Pesticides				

Improved seeds				
Others				

Section 6: Agricultural Extension and Credit provisions

Were you included in any extension program?

☐ Yes ☐ No

If yes, what sort of advices is available and how effective are these advices?

Type of advices	Extent of effectiveness					Don't know
	Very good	Good	Not good	Bad	Very bad	

What do you think about the current extension programme in helping you to increase your crop production?

☐ Very useful ☐ some times useful

☐ Useful ☐ Not useful at all

Others specify _____

Do you have access to credit services?

☐ Yes ☐ No

If yes, what are the purpose, source and amount of credit you have received last year?

Purpose of credit	Source of credit	Amount of credit	Interest rate

Section 7: Livestock Possession

Please give details of livestock owned by the household

No.	Type of the livestock	Total number
1	Oxen	
2	Cow heifer	
3	Bull calves	
4	Horses	
5	Mules	

6	Goats	
7	Sheep	
8	Donkey	

Do you have any problem managing your livestock?

☐ Yes ☐ No

If yes, what problem do you have?

☐ Not enough land for grazing

☐ Lack of veterinary services

Other _____

Section 8: Of-farm Income Generating Activities

In the last one year, did you or any other member of the household work off the household's land either on some one else's land or in some other employment, against payment in cash or in kind or as part of a labor sharing agreement?

☐ Yes ☐ No

If yes, give details please/?

H H Member	The kind of work	Location of employment	How many days worked in the last one year		Total amount earned in the last one year	
			Days worked for pay	Days worked for traditional labour sharing	In birr	In kind
Household head						
Spouse						
Male children						
Female children						
Others						

Section 9: General Questions on Crop Production Practices

When did you start planting coffee for the first time?

- ☐ More than twenty years ago ☐ 15-20 years ago
☐ 10-14 years ago ☐ 5-9 years ago ☐ 0-4 years ago

What makes you decide to grow coffee?

- ☐ Its market value ☐ was told by development workers about its importance
☐ Just saw people doing it benefited ☐ lost confidence in the other crops I grow
☐ Coffee is easy to grow than other crops other _____

When did you start growing maize for the first time?

- ☐ More than twenty years ago ☐ 15-20 years ago
☐ 10-14 years ago ☐ 5-9 years ago ☐ 0-4 years ago

What makes you decide to grow maize?

- ☐ Its price on the local market ☐ for it requires less work compared to other crops
☐ For it gives better yield on the same amount of land compared to other crops
☐ Because of the improved seed brought by extension services
☐ Because I lost confidence in other crops I grow before

Other _____

Which crop do you prefer to grow most? Can you mention the crop type and its advantage over other crops you grow please?

Why do you think these two crops maize and coffee spread over the highlands?

- ☐ Due to the changing climate ☐ Due to their relevance on the market
☐ Due to the extension service geared towards these crops
Other-----

What happens to other crops when these two crops were first introduced what happens to
enset for instance?

☐ They were grown side by side with other crops

☐ They were gradually replaced by other crops

Do you believe in godmi?

☐ Yes ☐ No

If no, why?

☐ Because I think it is a sin believing in godmi

☐ Because i believe the godmi doesn't work at all

☐ I use to believe in it but as of recent years it stopped functioning

☐ Because I don't understand what it is

What is the most serious problem you are facing with regard to weather in your area?

☐ Heavy rain ☐ Declining rain

☐ Dangerous heating of the sun killing crops ☐ Shifting season of rain

What are the three most important problems that affect negatively your crop production?
(Please enter in order of importance)

1 2 3

☐ ☐ ☐

(A) Insect (b) birds (C). Weather (temperature and rainfall) (D) lack of fertilizer
(E) lack of improved seed (F) shortage of land (G) lack of know how (H) lack of
credit (I) lack of oxen

If other please specify and rank _____

DECLARATION

This thesis is my original work, has not been presented for a degree in any other University and that all sources of materials used for the thesis have been duly acknowledged.

Tatek Kebede

Signature _____
Date _____

This thesis has been submitted for examination with my approval as University advisor.
Gebre Yntiso (PH.D)

Signature _____
Date _____