ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES
COLLEGE OF DEVELOPMENT STUDIES

Practices and Constraints of Turmeric (Curcuma domestica Val) Production and Marketing by Smallholder Farmers: The case of Yeki Woreda, Shaka zone in southwestern Ethiopia

By

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DEVELOPMENT STUDIES

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Acronym

CSA	Central Statistical Authority of Ethiopia
CREATING	Collaborative Research In Eastern Africa Territorial Integration within Globalization
ECBP	Engineering Capacity Building Program
EEPA	Ethiopian Export Promotion Agency
EIAR	Ethiopian Institute of Agricultural Research
FGD	Focused Group Discussions
FTC	Farmers Training Center
GDP	Gross Domestic Production
ha	hectare
HH	Household
JARC	Jimma Agricultural Research Center
Kg	kilo gram
KII	Key Informant Interview
m.a.s.l	meter above sea level
MIS	marketing information System
mm	millimeter
MoARD	Ministry of Agriculture and Rural Development of Ethiopia
MoFED	Ministry of Finance and Economic Development/Ethiopia
NBE	National Bank of Ethiopia
NTFP	Non-Timber Forest Products
PRA	Participatory Rural Appraisal
Qt	quintal
SD	Standard Deviation
SNNPR	South Nations and Nationalities of Peoples Region
SPSS	Statistical Packages for Social Sciences

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Abstract

Turmeric(Curcuma domestica Val) is one of the spices produced in Ethiopia entirely by smallholder subsistence farmers in southwestern part of the country. It composes a significant proportion of smallholders' income and it is one of the diversification crop used by coffee growers. It is also one of the potential export crop considered in agricultural development strategy of Ethiopia towards the commercialization of smallholders' farming. However, the total production volume and productivity of turmeric is very low compared to its potential in the country. Its contribution to the spice export compared to its potential is yet unexploited because of the weak link of production and marketing. Farmers use low yielding varieties and traditional harvesting and processing techniques.

This study was initiated to assess the current practices and constraints of turmeric production and marketing in major production areas and to draw lesson for future interventions. The empirical study was conducted in Yeki woreda of Shaka zone in Southwestern Ethiopia. Both qualitative and quantitative data were used that are collected through PRA tools and structured questionnaire. Descriptive statistics were employed to analyze household survey while the qualitative data was analyzed and interpreted through explanations and logical reasoning at the spot.

Even though turmeric production plays an important role in the producers livelihood, it's trend of production, productivity and quality has declined continuously for the last ten years. Farmers are currently aggressively replaced by maize, sorghum and coffee because of the relative price decline of turmeric. The market situation is characterized by anti-competitiveness and the producers were forced into the role of price takers. Its production and marketing are highly constrained by low prices, poor marketing information services; labor and fuel shortages; weak extension services and poor processing techniques and imple-

ments. Reforming the anticompetitive marketing system of turmeric; improving the extension services; promotion of improved processing implements; provision of relevant marketing information through appropriate methods such as local radios can motivate farmers to continue producing turmeric. In this way the commercialization and specialization programs of agricultural development strategy will continue contributing to poverty reduction and diversification of export items simultaneously.

Key words: Turmeric, spices, Southwestern, marketing information, commercialization

Derese Teshome,
July 2009

Chapter one

1.1. Introduction

Agriculture remains the mainstay of Ethiopian economy contributing about 44.1% to national GDP(NBE, 2008). The majority of the population in Ethiopia live in rural setting with urban population accounting only 16%(CSA, 2008). The country has embarked on rural development and poverty reduction strategy through agricultural commercialization and diversification programs as the main cornerstone of the strategy.

The agricultural strategy of Ethiopia revolves around the intensification of marketable farm products both for domestic and export markets. The broader goals of commercialization are the shift to high value crops; promoting export crops and focus on selected high-potential areas. In this regard spices are high value crops, produced in its high potential area for market. This is an opportunity for the nation to better integrate many farmers with markets-both locally and globally, as the majority of spice growers in Ethiopia are private small scale farmers(MoFED, 2006).

The policy arguments of smallholder commercialization in developing countries were generally supported in the view of food security and reducing rural poverty(Shepherded, 1997 as cited in Deveroux and Maxwell, 2001). But the impacts of smallholders' farm commercialization are dependent on the local context and policy environment of that particular nation and situation (von Braun and Kennedy, 1994). Commercial agriculture in Ethiopia with export crops has been started long ago by use of indigenous crops and adoption of other cash crops among which spices are the main. The agricultural policy has targeted farm commercialization and enhanced marketability of coffee, tea and spices. These

crops were believed to transform the agricultural sector from subsistence to more market-oriented mode of production(MOEFD, 2006).

Despite the long standing debates on the impact of cash crops on food security, spices produced by smallholder farmers have constituted the major share of households' income and also foreign exchange source for Ethiopia. In South-western Ethiopia the production of spices, in addition to coffee, has served as an alternative opportunity to increase smallholders' participation in commercial agriculture. Ethiopia was considered as a home land for many spices and stimulants (Edossa, 1998). The majority of these spices are grown by smallholders operating on small plots of land around homesteads and on some private and state farms. The total area covered by spices on private farmers' holdings in Ethiopia is estimated to be over 96,000ha (CSA, 2004). The production is dominated by small scale producers mainly in two regional states, Oromia and SNNP.

Turmeric (Curcuma domestica Val) is one of the low land spices grown in south-western Ethiopia by smallholder farmers. Turmeric is an erect perennial crop that resembles a young banana plant, except small in size. It is believed that turmeric was introduced to Ethiopia in the late 1960s probably from Srilanka. Rhizomes of turmeric are the products marketed by the producers. The rhizomes have a closely ringed, corky epidermis externally and a bright-orange flesh with a distinctive smell and taste (Purseglove, 1981).

The introduction of turmeric as cash crop to Ethiopia and its appearance in export items is very recent when compared to other crops. It was also realized that turmeric has served the producer farmers as important income diversification crop and a link to the local markets. Ethiopia satisfied the domestic consumption need by production after 1972(Edossa, 1998). The production of turmeric was localized in the Southwestern Ethiopia mainly around Teppi(JARC, 1991). Dry

polished turmeric rhizome is the product for the domestic use and export market. Yield potential of turmeric in the research stations was reported as high as 310 qt/ha fresh turmeric which is within the acceptable range of world turmeric productivity (Girma *et al,* 2008). The variety under production by the majority of the farmers in southwestern Ethiopia did not meet world market standards because of its poor processing and post harvest handling techniques (Digafe, 2009; Personal communication).

Turmeric was one of the spices exported from Ethiopia along other spice items. The contribution to the national revenue during the last three years 2006, 2007 and 2008 were 2.68, 3.65 and 3.94 million birr respectively (MoARD, 2008). It is a significant contribution but the trend and magnitude of contribution varies over years based on volume of production in the country and quality product supplied to the market.

1.2. The Research Problem

The commodity export in Ethiopia is dependent on few agricultural products (Teresa, 2000). But the country is endowed with diverse and favorable agro ecological potentials for many other export crops that will add to the growth of export market. Spice in Ethiopia is yet unexploited with low production volume and low productivity attributed to the limited use of improved technologies and weak marketing system to motivate farmers. In recognition to the underutilization of the crops and the need to diversify export item, the commercialization and specialization scheme of agricultural development strategy of Ethiopia has focused towards increasing production and productivity of spice crops(MoFED, 2006). A considerable amount of resources were committed on research and extension services for more than two decades and as a result appropriated technologies on different spices including turmeric were generated(Girma *et al,* 2008). Use of improved production technologies (e.g varieties) and improving the efficiency of existing operations increases the production and productivity of spices

and help farmers to maintain their economic viability (Lindara *et al,* 2004). In this line also turmeric producers lack efficiency of operation and harvesting the produce which is highly interlinked with the available market.

In addition to the appropriateness of technologies generated, sustainable production of cash crops like turmeric can be influenced by marketing constraints. It was hypothesized that the existence of efficient marketing and related services are the basic ground towards accelerate adoption of cash crops(Lukanu *et al,* 2004). It has an impact on enhancing farmer's income. But in the study area with the crop under study the marketing function and related services remained a problematic service for it was given in a fragmented way and was limited to very few agricultural products (e.g. coffee).

Turmeric has faced the challenge of decline in volume of production and discontinuity of technology use by most farmers because of the poor marketing incentives. In order to reverse the declining situation there is a need of investigating the current practices and factors that affect the production and marketing of turmeric in the study woreda. Thus, the purpose of this study was to assess the status of turmeric production and marketing practices and associated constraints at household level.

1.3. Objectives of the Study

General objective

The general objective of the study was to assess the practices and constraints of turmeric production and marketing by smallholder farmers.

Specific Objectives:

- To understand the contribution of turmeric production and marketing to household income of the producers.

- To assess the practice of turmeric production in the study area and influencing factors.
- To assess turmeric marketing practices and associated constraints.
- To explore marketing information access in terms of source and methods to receive.

1.4. Research Questions

a. Farmers have adopted turmeric varieties and production packages for more than three decades. They have allocated a critical resources i.e. Land and labor to produce turmeric. Considering the importance and relative shortage of these resources at smallholder situation, what is the extent of contribution of turmeric income to the total annual income of the households and what are the factors influencing its contribution.

b. Discontinuation and displacement of turmeric production is being observed in smallholder farms. What are the main factors for the discontinuation, reduction and abandoning of turmeric production in the study area?

c. Marketing information is an input for farmers to effectively utilize market opportunities. But how do farmers access market information? Do farmers access information they need? Do they have preference for some type of information, methods and sources to receive marketing information? How does market information determine their involvement in turmeric production?

1.5. Significance of the study

Smallholder farmers are advised to adopt cash crops and commercialize their farms. This fact is with the assumption that food security and poverty reduction can be achieved by intensifying and commercializing their farming system. The

result of the study contributes to the agricultural commercialization effort of the country by considering both the pros and cons of producing non food cash crops in the context of food security agenda.

Farmers in southwestern Ethiopia are endowed with agro ecological advantages to produce different spices as cash crops such as ginger, black pepper, long pepper, cardamom, Korerima and many other species among which turmeric is one. Even though the introduction and production of turmeric has long history in Ethiopia since early 1970, the impact on the national economy was nominal. Turmeric was grown as cash crop by smallholders in the southwestern Ethiopia for the local markets. But the crop as an export item was reported as potential and underutilized at national level and that can be maximized in the near future.

The trend of turmeric production and marketing is not in the same magnitude as expected to happen in major producing areas but rather on the trend of declining situation. Therefore, this piece of work will contribute towards better understanding of the production and marketing of the crop in Ethiopia for effective planning of technology generation, technology supply and improving the marketing services of turmeric. This will be achieved by systematic investigation of information gaps with regard to turmeric production, technology use and marketing from the smallholder producers' perspective.

1.6. Scope and Limitation of the Study

Within the spice sector there are different types of them which vary by their way of production; method of processing and ecological adaptations. In this study emphasis is placed on lowland spices with particular focus on turmeric(Curcuma domestica Val). This study is limited to the investigation of the current status of turmeric production and marketing from the smallholder farmers perspective. Even though turmeric production have wider area coverage in the southwestern

agro ecology, the empirical study was limited to the situation of Yeki woreda of Shaka zone. All woredas in the zone produce turmeric at different level but the conclusion and implication drawn from this study will be limited to Yeki woreda. The other two woreda in the zone have a different cropping pattern, socioeconomic situations and agro-ecological settings.

Spices in general and turmeric sector in particular faces a serious shortage of data. Specially data on production status and price related information. The problem is part of the general problem on spices in Ethiopia. There is no consistent and reliable data source for the volume of production and export of the various spice crops from Ethiopia. The available data is an aggregate of many species which makes individual species analysis very difficult.

1.7. Organization of the Thesis

The main body of the thesis is organized in six chapters. Chapter one deals with introduction to the subject under study with regard to the importance in the Ethiopian economy with particular emphasis on export of cash crops. Statement of the problem, scope of the study, limitation of the study, general and specific objectives as well as research questions were entertained. In Chapter two review of relevant works on cash and food crop production arguments and policy directions, role of marketing and marketing information in cash crops were discussed. In the third chapter details of analytical framework and research methodology used in the study were explained. In Chapter-four dealings with the profile of respondents; contribution of turmeric to household income and relative allocation of basic production resources. Production and productivity of turmeric, technology supply and associated constraints were elaborated. Marketing practices, constraints and marketing information were discussed in the fifth chapter. Finally, in chapter six, conclusion and recommendations were presented.

Chapter Two

2. Review of Relevant Literature

2.1. Description for Turmeric Crop and Agronomic Practices

Turmeric (*Curcuma domestica* Val) is native to south east Asia and Indian region. The crop is distributed throughout the warm parts of the world while the major producers are India, Bangladesh, Jamaica and Srilanka (Purseglove, 1981). Turmeric consumption at local level is its flour for coloring food reciepes especially the local sauce called 'wet' and bread as well. It is called 'irid' in Amharic language. Prior to the introduction of the crop to Ethiopia it was imported but after 1972 it was reported that Ethiopia satisfied in country turmeric consumption need by its own production(Edossa, 1998). It is thought that turmeric was introduced to Ethiopia in the late 1960's or early 1970's by agricultural researchers to Ethiopia. The crop was brought from Srilanka and is now extensively grown throughout the south and southwestern parts of Ethiopia. Jima and Teppi agricultural research centers were responsible to introduce and conduct adaptation research in all potential areas. So far the research center has recommended and released two varieties of turmeric to the potential areas. Later packages of the production and processing has been prepared by the center for use by producers. In this part of the thesis a brief account of turmeric production requirements and associated packages was discussed based on the production manual prepared for turmeric production and processing by Ethiopian Institute of Agricultural Research(EIAR) which is published on the institute's web page(www.eiar.gov.et) and Research achievement reports on spices by Girma et al(2008).

Uses of Turmeric

The rhizomes are the essential part of turmeric plant as they are the structures used both for consumption and propagation. Besides the uses as coloring power in different foods and beverages preparations, color extracts from turmeric are

employed in textile industries, soap and cosmetic factories as well as in pharmaceutical preparations(Girma *et al*, 2008). Morphologically turmeric is an erect perennial spice that resembles a young banana plant, except small in size. It resembles young banana in its leaf shape and arrangement. Rhizomes of turmeric are much branched, thicker and more rounded. The rhizomes have a closely ringed, corky epidermis externally and a bright-orange flesh with a distinctive smell and taste.

Agronomic Requirements of Turmeric

According to the research conducted on agronomic requirements, for a successful establishment and production of turmeric a rain fall of about 1000-2000 mm will be needed. In cases with annual rainfall short of the minimum use of supplemental irrigation is recommended. Even though turmeric performs best below 1500m.a.s.l, the crop can grown up to 2000 m.a.s.l. Generally turmeric requires hot and humid climate. It also requires well prepared loamy or alluvia soil which is loose and friable.

The propagation method is vegetative and particularly the divisions of its rhizomes. Three types of planting materials can be prepared from the rhizomes. These are mother rhizome (arises from the original planting material), daughter rhizome(secondary rhizomes) and finger rhizomes(split rhizomes). Land for turmeric planting should be well prepared and ploughed to produce loose and friable seedbed. Based on soil type and rainfall condition of the area; planting can be in furrow, on flat beds and on ridges.

According to the results of a study conducted in Jima research center the appropriate planting time for turmeric was determined to be in March both for yield and quality aspects. The rhizomes should be planted at spacing of 30 cm between rows and 15 cm between the plants. Once or twice weeding, earthening and ma-

nuring are the essential field management operations in turmeric production. Earthening is very essential after eight weeks of planting to improve the development of the rhizomes and yield, besides its contribution to weed control. Applications of farm yard manure, green manures as well as inorganic fertilizers can enhance turmeric yield. Researchers in the area claim that at the current situation the soil in southwestern Ethiopia where the crop is widely grown can support turmeric without application of these inputs. It implies that turmeric is grown organically since its introduction to Ethiopia.

Turmeric reaches harvestable stage after 8-9 months. Harvesting takes place usually when the lower leaves of the plant dry and turn yellow and pseudo stems withers and start to lodge. After removing the upper leaves, the rhizomes will be removed from the soil by use of fork or other appropriate tool. After separating the rhizomes by their type and size, it will be washed to remove the soil. Turmeric rhizomes have to be cured after harvest for both color and aroma. The traditional method of curing rhizomes is to steam or boil fresh rhizomes for 45-60 minutes in a barrel. The purpose of 'curing' is to remove the raw odor, reduce the drying time, gelatinize the starch and produce a more uniformly-colored final product(Pruthi, 1998 and Girma, 2008). Traditionally the cooked rhizomes were spread on the ground in the sun to dry and this process takes up to 15 days.

Drying Turmeric Rhizomes

Today the majority of internationally-traded turmeric rhizomes are artificially dried with hot-air drums, tray and continuous tunnel driers. Rhizomes to be dried can be sliced or whole, with slicing generally producing a more uniform and brightly colored powder(Schweiggert *et al,* 2008 and Pruthi, 1998). The final moisture content should be close to 8-10%. After processing the yield of the dried product varies from 15-25% depending on the variety and the crop-growing environment(Pruthi, 1998).

Turmeric Polishing

Dried turmeric rhizome has a rough dull outer surface with scales and root crumb. Smoothing and polishing the outer surface by manual or mechanical rubbing improve the appearance. Manual polishing consists of rubbing the dried turmeric on a dried surface. The mechanical methods can be a hand-operated barrel drum or power-operated drums. The turmeric rhizomes are rotated and the polishing occurs with abrasion against the metal mesh of the drum and mutual rubbing of the rolling rhizomes.

2.2. Cash Crop Production and Smallholders' Food Security

The choice between subsistence food crops, on the one hand, and cash crops, especially nonfood cash crops predominantly meant for exports, on the other hand, is a subject of considerable debate among policymakers as well as development specialists(Poulton *et al*, 1998). The debate raises issues not only at the level of farming households but also at the level of national and international policies, including macroeconomic policies such as trade and exchange rate policies(Islam, 1994). In general the shift from basic food crops, which are produced and predominantly consumed on the farm, to cash crops, which are produced mainly for sale in the market is viewed as part of the commercialization of agricultural process(Islam, 1994). But from smallholders food security aspect Maxwell(2001) has stated the arguments set by "food first" advocates about the production of basic food crops. It was argued that food crop production deserves to be accorded higher priority even if nonfood export or cash crops enjoy a comparative advantage and higher yield. The reason usually advanced for such a proposition is that export crops, especially agricultural raw materials and tropical beverages (the principal exports of developing countries), tend to suffer from a long-term decline in the terms of trade(Islam, 1994). The instability of prices of both export and food crops in the world market has been advanced as an additional argument against dependence on the world market for a basic need such

as food which can also traced from the reality in the current food crisis of the globe.

The arguments for cash crop seem sound from the growth point of view. Maxwell(2001) has summarized the thought in favour of cash crops as follows:

"

a. All farmers and countries to exploit comparative advantages, and there by maximize income;
b. Generates an investible surplus which helps to maximizes growth again for both farmers and nation;
c. Generate linkages both upstream to the supply of inputs and downstream through the use of products, which again generates growth and livelihoods."

In the same token Spooner(1988) as cited in Maxwell(2001) argued in favour of cash crops in terms of their capacity to transform the national economy of the country. But the critics of pure cash cropping, particularly in the 'food-first' school of thought argues that comparative advantage is the poor guide to agricultural investment. The argument against comparative advantage was basically based on the incapability of market to work smoothly everywhere as it is highly influenced by the policies and availability and access to market. The idea from dependency school thinkers was also synthesized with basic question of reliance on markets which makes both households or nations vulnerable to competition, price variability and physical controls(Maxwell, 2001). From the arguments for and against cash crop, Maxwell(2001) has what is called 'good' cash crop. According to this author's argument 'good' cash crop is a food crop which generate several by- products, that have a short maturation period and that can be processed locally. This is an idea that relied on the food crop first and against pure cash crops for smallholder subsistence farmers.

The nature and extent of competition versus complementarities between subsistence crops for own consumption and crops for sale in the market are central elements of the forces that drive the food security effects of commercialization(Von Bran, 1994). It is because it determines the reallocation of land and labor resources that occurs with commercialization, as well as the profitability and productivity of the commercialized crops as compared with the subsistence food crops. There are two line of argument on the potential impact of pure cash crop in food in secured smallholder subsistence farmers. One line of argument emphasized the potential impact of nonfood cash crops on food crop availability and nutrition security which is influenced by the functions of marketing(Maxwell, 2001). The other argument was based on commercialization as a means to alleviate rural poverty raised concerns about small land-holders and food insecure households and non-adopters, and inequity in the distribution of benefits generated from the cash crops. In recent years, the focus of international and national agricultural research efforts has tended to shift away from export or cash crops toward food crops in response to pressing food needs in many developing countries(Maxwell, 2001). But this shift in focus is more true of international than of national research expenditures. Carswell (2003) in here analysis of the colonial times research expenditure on export crops stated that cash crops received high priority in most developing countries. Consequently, while a reallocation or shift of emphasis in research efforts was needed in the post independence period, given the past neglect of research on food crops, the balance may have shifted too far on the reverse way, thus sacrificing opportunities for efficient export crop production in the developing countries.

It is very evident that the argument against cash crops cannot be fully acknowledged and finalized by agricultural countries as their economies are basically based on the production and export of primary agricultural products (Robert, 1984). In the other hand the majority of cash crop producers are smallholder

farmers in which it contributes a great deal to their livelihoods. Despite the controversy raised by the development thinkers that farmers in food insecure areas should not be advised to produce pure cash crops, cash crops constituted a major source of cash income for the smallholder households and an opportunity to increase their participation in the market Shephered (1997 p.2) as cited in Devereux and Maxwell(2001).

2.3. Role of Marketing Information in Smallholder Cash Crop Production

Agricultural marketing serves as a link between production and consumption contributes to the growth of the national economy. However in most developing economies particularly in sub-Saharan Africa (SSA) the marketing systems are not well developed(Abbot et al, 1986; Mahlet, 2007; van der Laan, 1999). The transformation of peasant agriculture from a subsistence economy to a more commercialized system based on well developed markets is very critical in promoting economic growth and poverty reduction(Abbot *et al,* 1986). Among the elements of well developed markets marketing information system(MIS) is very critical and important component that enables the smooth running of the other marketing systems as well.

Marketing information services generally includes the regular collection of commodity prices and supply conditions from major market centers by government staff(Ferris *et al,* 2008). Information collected from wider sources are sent to a centralized data processing center, typically housed in the Ministry of Agriculture or Trade, where it is collated before being disseminated back to a range of clients(Ferris *et al,* 2008). The dissemination of prices and market news is achieved through various media options such as radio, newspapers, internet, email, mobile phone and notice boards to farmers, traders, government officials, policy makers, development agencies, and others, including consumers. The overall purpose of marketing information supply is to assist producers and trad-

ers in balancing supply and demand on particular markets, and so to limit excessive price fluctuations(Ferris *et al*, 2008).

Market information can be obtained from various sources, but government is responsible body for reporting prices, production, disposition, and utilization statistics in different markets periodically to keep participants more fully informed of what the future might bring (Downey and Erickson, 1987). The provision of these widely needed marketing information through public or government institutions is believed to be efficient as it narrows the range of cost over which farmers, traders and consumers must find information themselves (Scot, 2003). According to Shepherd(1997) cited in Devereux and Maxwell(2001), market information comes in two main formats: 1) public dissemination of prevailing market prices and conditions, and 2) provision of price trend analysis for specific commodities over time. There can be spot information supply which is most useful for direct sales negotiations and to keep abreast of marketing conditions. Shepherd(1997) has also pointed also the importance of providing and spread of market information based on longer period trend data allows farmers and service providers to make major decisions on types of crops to be grown and when to harvest crops based on seasonal price trends.

It was also stated that the provision and application of market information is as much a part of agricultural business as seeds or farm tools but most farmers are too poor to provide for themselves information from beyond their immediate vicinity(Peter and Shaun, 2000). It is assumed that information access in time and the right type needed by farmers enhance their livelihood sustainability especially for the rural poor(Dawit *et al*, 2006). Based on pilot research project in Uganda in relation to marketing information supply, Robbins(2000) found out that provision of market information has brought about certain predictable changes in markets of agricultural products and contribute towards overcoming

issues of market failure. In Africa the role of MIS services go beyond the basic function of balancing demand and supply. The critical role of market information in Africa is to monitor food security conditions. Therefore, the food security information system in the area of food security management is increasingly important (Devereux, 2001).

For Ethiopia, the case study conducted by Bezabih and Hadera(2007) on horticultural crop marketing in eastern part of Ethiopia and Eleni Z. (2001) on grain marketing as well as the work of Nigussie et al (2007) on coffee showed that the agricultural markets Ethiopia are characterized by poor access to appropriate market information. According to these authors lack of market information represents a significant impediment to market access for smallholder producers. It significantly increases transaction costs and reduces the efficiency of agricultural sector. The result of their analysis indicated that the majority of farmers in the country receive market information from sources which lack transparency in the market information system because brokers and middlemen often withhold reliable market information in order to purchase products very cheaply to sell with large margins. Another study conducted on the economic profitability of Cardamom spice in Uganda's smallholder farmers showed that the low profitability of the crop is resulted from low prices that can be attributed to poor market information availability for the farmers (Lwasa and Bwowe, 2007).

In Ethiopia the major sources of market information were found to be neighbors, traders and the visit to market place or marketing day itself (Dawit *et al*, 2006). But not all peasants have equal access to such information. There is no market

extension services meaning there is no or little information on prices and on which grains are demanded and where.

Chapter Three

3. Analytical Framework and Research Methods

3.1. Analytical framework: Production and Marketing

Market availability and agro-ecology based comparative advantage may trigger the use of new agricultural technologies. In this regard market lays an important guarantee in maintaining the continuous use of technologies and production for sale. For a smooth marketing relation marketing information is the tool that guides major farm decisions and enhances marketing efficiency(Timothy and Robert, 2007).

Specialization and commercialization were seen as a broader strategy of comparative advantage. The underlying assumption is that markets allow households to increase their income by producing that which provides the highest returns to land and labor and then using cash to buy household consumption items, rather than being constrained to produce all the various goods needed for home consumption (Timmer, 1997 as cited in Jayne, 2003). This comparative advantage is well accepted under the assumption of well functioning markets. But in reality the process of commercialization through cash crop can be impeded by costs and risks in the food marketing system(Jayne, 2003). The primary purpose of adopting new technologies of either cash crops or food in developing economies and poor subsistent farmers is to alleviate poverty and secure food security.

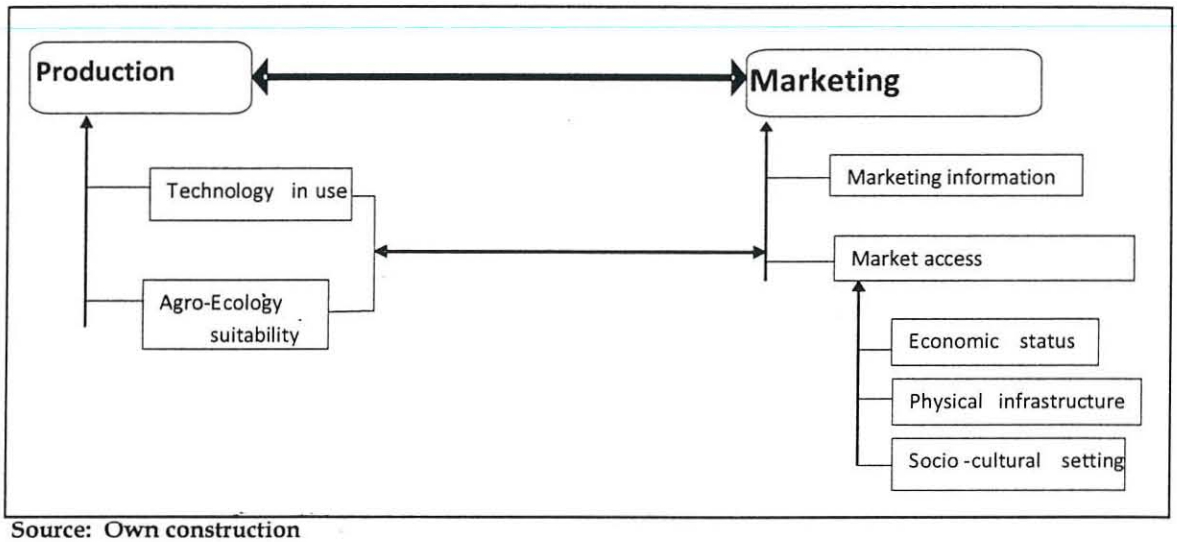
Ideally commercial crops are non food crops produced entirely for sale in the market. Selling or commercialization of food crops can also fall in the commercial crops if it was found in excess supply of family consumption but not equivalent to an accidental crop sale by farmers(Workneh N. and Roth M., 2002). Under certain situations the comparative advantage is based on the agro-ecology that influence what to produce and what to purchase from market.

Market information influences marketing decisions such as what crop to produce and how much to produce and for how long to store for better prices. But in the absence of effective marketing services to the farmers, inefficiency in marketing will be more prevalent. At the local level, commercialization which is equivalent to cash crop production is affected by many factors, including agro-climatic conditions and risks; access to markets and infrastructure; community and household resource and asset endowments; development of local commodity, input, and factor markets; laws and institutions; and cultural and social factors affecting consumption preferences, production, and market opportunities and constraints(Pender and Dawit, 2007). Marketing information service as a factor have a significant impact on the competitiveness of the markets and negatively affect the farmers' well being((Timothy and Robert, 2007). Unsatisfactory marketing system in small scale production will result in weak bargaining power of farmers. In this study the analytical framework adopted to analyze turmeric production system as a cash crop, starts with the assumption that market will guide the production and adoption of new turmeric technologies.

Turmeric as new crop to the area was adopted and existed for more than three decades in the smallholder farms. The theoretical linkage is that total production of turmeric is a function of well developed market. Despite the attractive or discouraging marketing signals to increase or decrease production volume, the practices of farmers in relation to other competing crops are also very important. The quality and volume of production determines prices of the produce that goes to the producers. These prices are also intern affected by the availability of needed and reliable marketing information(Oscar *et al*, 2004). Availability of market information is also affected by the presence of infrastructure, exposure of farmers to extension services, distance to the nearest market center and the simplicity of information to be easily understood by the users.

The diagram on figure 1 below summarizes the relationships considered and adopted in this study for production and marketing of turmeric. In short production is assumed to be influenced by the level of technology use and agro-ecological settings. The performance of the market is also influenced by the presence of reliable marketing information, and access to social and economic resources.

Figure 1 Analytical framework adopted-production and marketing



Source: Own construction

3.2. Research Methods

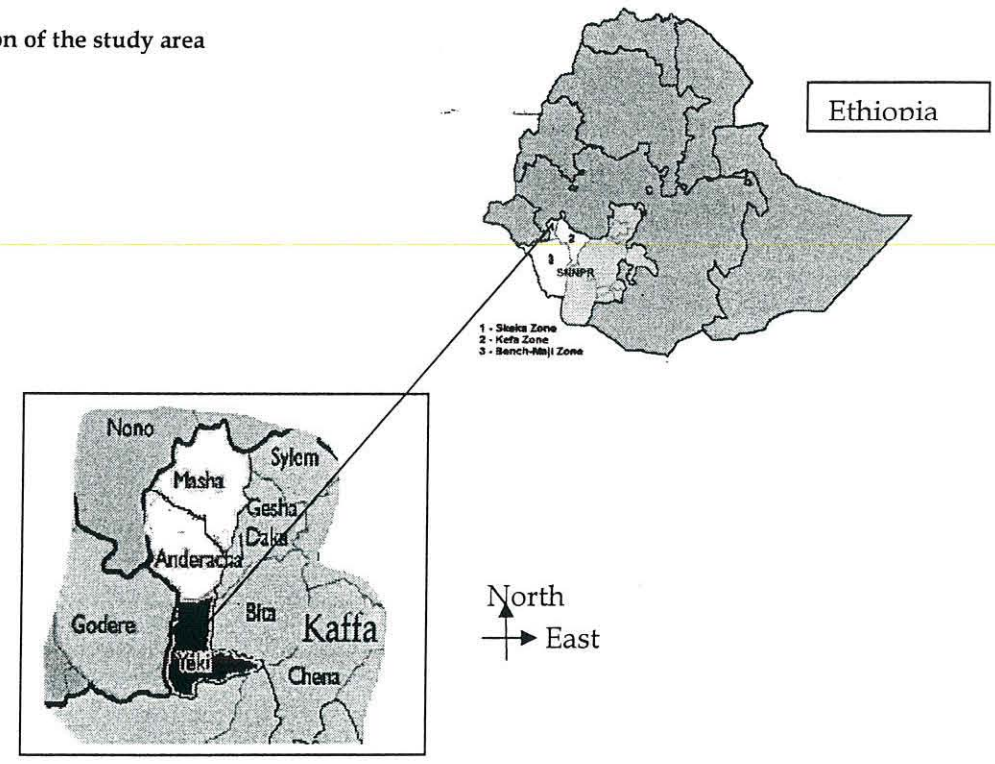
3.2.1. Description of the Study Area

The empirical study was conducted in purposefully selected Shaka zone of South Nations and Nationalities of People region (SNNPR). Shaka zone is found in South western Ethiopia with a total population of about 200,000(CSA,2008). In the zone there are three woredas among which Yeki was one. Population distribution in the three woredas was 67%, 21% and 12% in Yeki, Masha and Anderacha respectively. The proportion of male was 51% , and about 83% of the total population live in rural area (CSA, 2008). Yeki woreda, the study site, was the

most populated woreda composed of the largest share of the population of which only 18% dwell in town.

Shaka zone was selected purposefully for the reason that most lowland spice are grown in the zone and it is considered as one of the specialization area for spice production within diversification programs. The zone has three woredas among which Yeki was selected purposefully for the in depth investigation. This woreda was selected on the basis of volume of production, area under cultivation and relative importance of turmeric in household economy of the producers. It is in this woreda where Teppi spice research center is located and it is also assumed that this woreda has received turmeric technologies better than any other locations because of its proximity to research center and concerted effort of spice extension services in the area.

Figure 2 Location of the study area



3.2.2. Research design and Sampling techniques

3.2.2.1. Design of the Study

The focus of this research was to explore the practices and constraints of turmeric production and marketing by smallholder producers. Turmeric grower farmers were the main source of information. Different combination of approaches and methods were used to gather the required data. For the collection of the primary data a combination of qualitative and quantitative approach were employed. PRA and household survey methods were used to collect primary data from household heads. A household was the unit of analysis for the household survey.

The study has two phases for the collection of data. The first phase was qualitative survey that employed selected PRA tools such as key informant interview, focus group discussions and pair wise ranking. The purpose of the first study was to explore and develop deeper insight to the research problem and the study area in general. It was realized from the first part of the study that farmers produce a diverse types of spice crops on their farms, but very few of the spices grown were commercialized and important to the household income. Turmeric was found important spice grown by the majority of smallholders. The second part of the study employed quantitative survey that utilized structured questionnaire as a tool. It is used to complement the qualitative information by way of quantifying some of the parameters to show trends. The major data source for this part of the study were turmeric grower smallholder farmers operating in Yeki woreda.

3.2.2.2. Selection of Study Kebeles

In consultation with the woreda agricultural extension unit all the 23 kebeles found in the woreda were stratified as high, medium and low production based on the average records of the last five years. Accordingly five kebeles were se-

3.2.3.2. Primary Sources of Data

Turmeric grower farmers were the major source of survey data for this study. Elders in the village, researchers in Teppi research center, extension workers in the respective kebeles and extension experts in the woreda has served as key informant in the study woreda.

3.2.4. Data Collection Methods

3.2.4.1. Key Informant Interview and Field Visits

First visit was made to the marketing places of turmeric . Discussion was held with four local collectors in Hibret-fiere kebele. Visit and discussion was also made with farmers who were boiling(processing) turmeric in Ebi village. Another visit was also made to turmeric partial processing site in Hamus-gebeya village. Two traders in Teppi town were interviewed about the marketing of turmeric and processing of turmeric with particular attention to the trend of price and quality of turmeric. Discussions were also held with woreda extension expert on aspects of production and extension services rendered on spices in general and turmeric in particular. As a result all constraints were listed and categorized as limiting and important in turmeric production in the woreda. Two researchers from Teppi agricultural research center were consulted for the profile of available technologies and their views on farmers technology utilization level; production problems and compatibility of the technologies released so far to the community. As an important category the marketing service unit of Yeki woreda was also consulted on the marketing issues and associated problems.

3.2.4.2. Focus Group Discussion

Initial pilot data were collected about the turmeric production and current status from key informants in February 2009. Following consecutive discussions conducted in all the kebeles with key informants and extension workers, focused

group discussion was held with farmers group invited to Teppi research center. The compositions of the selected farmers in the group discussion were:

- elders who have worked in turmeric for more than 30 years and those who most likely started cultivating turmeric in the woreda.
- Model/innovative farmers awarded at regional and national level
- Young farmers
- Female farmers
- Farmers participated in crop trading(especially turmeric)

From among the farmers invited for discussion, 25 farmers were selected to be considered in the focus group discussion. Discussion points were formulated in advance by crosschecking the importance and relevance to the study objectives based on information obtained from key informants and field observations. Two facilitators and one reporter have presented the theme to the groups for discussion. The aim of this focus group discussion was to obtain an overview of turmeric production status in their village, major changes since its introduction, causes of change and the factors influencing cultivation of turmeric as cash crop in the current situation. The marketing problems and the way out was also the core of discussion. The FGD was also used to aid in fine-tuning of the questionnaire used later to gather details on production and marketing challenges of turmeric in Yeki woreda by smallholder farmers. In addition constraints and opportunities of turmeric production were ranked using pair wise ranking PRA tool.

3.2.4.3. Questionnaire Based Household Survey

Based on the first study a questionnaire relevant to the research objectives and research questions was constructed and pretested on non random five farmers before it was used for an interview. The interview was conducted by trained enumerators from Teppi research center in the selected three kebeles. The trained interviewers were given a list of the selected respondents to interview. An alter-

native respondent for each member was also listed to use enumerators time effectively and ensure the representativeness in each kebeles. A total of 120 household heads were interviewed. Household heads were selected from the three kebeles by systematic sampling method from the sampling frame prepared in advance. demographic and socioeconomic information; turmeric production level and trend; land and labor allocation; marketing practices of turmeric and marketing information related data were collected using the questionnaire. The actual data collection was conducted in March 2009.

3.2.5. Data Analysis

Qualitative data collected using key informant interview(KII), focus group discussion(FGD) and field level observations were analyzed through logical reasoning, explanations and comparisons. Some of the data collected using FGD were analyzed at spot and narrated that was used later to complement information obtained through formal survey. SPSS version 15, computer software was use to organize and analyze quantitative data collected by questionnaire. Socioeconomic characteristics of farmers was analyzed using descriptive statistics such as frequency, percentage, mean, median, minimum, maximum and other descriptive statistics. Bivariate analysis was used extensively to relate the various categorical variables. Tables, graphs and Charts were used to present the results from the analysis.

Chapter Four

4. Results and Discussions

4.1. Socioeconomic and Demographic Characteristics of Sample Households

Sex: Female headed households in the sample of respondents were only 7.5% while about 92.5% of the sample of households are male headed. Turmeric producer female headed households are very scanty as turmeric production is labor intensive. According to the local situation the majority of household heads are male farmers as they are the one who register for land tax. On the other hand very few women have land registered in their names so that they can be called household heads. Since in this study only household heads were included as respondents. The large majority of the respondents were composed of male households heads.

Age: About 72% of the respondents age ranges between 30 and 60 years and only 9.2% of them were below 30 years(youngsters). For 18% of sample respondents age was greater than 60 years. There is relationship between age of the respondents and educational achievements.

Religion: Christianity and Muslim were the dominant religions of the respondents in the study area. Among the respondents included in the study about 60% were Christian(Orthodox and Protestants) and 40% of them were Muslim religion followers.

Education: The educational profile of the respondents shows that about 53.3% have attended formal schooling. Only 19.2% were found illiterate in the sample of respondents. About 27.5% of the respondents have basic skill of reading and writing. As indicated in table 2 below, higher proportion of youngsters have attended formal schooling compared to older farmers included in the sample. As

age of the respondents increase in age category their proportion in formal schooling decreases(table 2 below). Attendance of formal schooling was 90.9% for youngsters and only 27.3% for older farmers.

Table 2 **Age and educational achievement of the respondents**

Age group(years)	Educational achievements		
	Illiterate(%)	Read and write(%)	Formal schooling(%)
Less than 30	9.1	0.0	90.9
Between 30 and 45	9.1	22.7	68.2
Between 45 and 60	20.9	37.2	41.9
More than 60	40.9	31.8	27.3
Total	19.2	27.5	53.3

Source: Own survey, March 2009

Income diversification non-farm activities: The major non-farm activities farmers involved as an income diversification option are hand craft, wage or casual labor, trading of crop and livestock and mini-shops. Among the sample respondents only 19% have non-farm activities as income diversification strategy. About 72.8% have participate in trading of agricultural commodities and village based mini-shops to supply consumable goods. Among participants in non-farm activities about 18% of the respondents were found working as casual daily laborers. Participation of farmers in non-farm activities in Hibret-fiere kebele was lower than *Beko* and Addis-*Berhan* kebeles. This might be because of the relative locations to the big town(Teppi) and better access for transportation.

Distance to main road and extension offices(FTC): Sample respondents in this study from Hibet-fiere kebele access the main road on average after 3.14km travel but for farmers in Beko kebele an average travel of 0.6km to the main road. Farmers in Addis-berhan have to travel on average about 1.7km to access the main road. The average distance to extension workers office(FTC) for

respondent farmers in Hibret-fiere, Beko and Addis-berhan kebeles is 2.2, 0.9 and 1.2 km respectively.

Family size: The average family size of sample respondents is about six per household with a wide range of 16(minimum one and maximum 17 household members). About halve of the respondents have less than five members with the most frequent family size of four.

Experience in farming and turmeric production: On average the sample of respondents have about 27 years of experience in farming. Farmers included in the study have on average 16.7 years of experience in turmeric production.

Table 3 below summarizes the distribution of important socioeconomic and demographic characteristics of household heads across the selected sample household heads.

Table 3 Profile of the sample households in Yeki woreda, 2009

Important characteristics		Kebele			Total (%)
		Hibret-Fiere(%)	Beko(%)	Addis-Birhan(%)	
Sex	Female	3.3	1.7	2.5	7.5
	Male	30.0	32.5	30.0	92.5
Age category(years)	More than 60	5.8	5.0	7.5	18.3
	Between 45 and 60	11.7	13.3	10.8	35.8
	Between 30 and 45	10.8	15.0	10.8	36.7
	Lower than 30	5.0	0.8	3.3	9.2
Educational level	Formal school	19.2	19.2	15.0	53.3
	Read and write	7.5	10.8	9.2	27.5
	Illiterate	6.7	4.2	8.3	19.2
Involvement in the Non- farm	No	29.2	26.7	25.0	80.8
	Yes	4.2	7.5	7.5	19.2
Religion	Muslim	18.3	14.2	7.5	40.0
	Christian	15.0	20.0	25.0	60.0

Source: own survey, March 2009

4.2. Status and Role of Turmeric in Smallholder Farmers' Income

4.2.1. Overview of Turmeric Production Status

The history of turmeric cultivation in Ethiopia started in Yeki woreda at a place called ***Korcha(in 1973?)***, which is now administratively in *Beko* and Hibret-fiere kebeles. During the early periods turmeric was produced in secret as the initial planting materials were drawn illegally from the nearby research center and as a result very few farmers know about it before three decades. Turmeric is exclusively produced by subsistence and smallholder farmers in Yeki woreda. There is no large scale turmeric production as well as agro processing industry that uses turmeric as raw material in Teppi or nearby towns. Yeki woreda is the major producer of turmeric in Ethiopia and it is one of the specialization area for turmeric at national level. The majority of marketed turmeric products is drawn from Yeki woreda and through Teppi market as the main market place for turmeric production in the country.

Production of turmeric in Yeki has longer history compared to other producing woredas. Teppi town, capital of Yeki woreda, is the largest market center for turmeric marketing for neighboring turmeric producer zones and woredas such as Bench-Maji zone, Kaffa zone and Godere woreda of Gambella region.

4.2.2. Major Farm Income Sources of Sample Household Respondents

Agricultural enterprises are the major livelihood sources for the majority of the inhabitants in the woreda. Sorghum, maize, finger millet, *teff* and taro are the major staple food crops for consumption at home. *Teff* and finger millet are not produced but purchased from market for consumption. Coffee and turmeric are the major cash income sources for the farmers in Yeki Woreda. Fruits especially mango and avocado are produced around homestead mainly for consumption. Very few farmers generate income from honey production and sale. A wide

range of vegetables are also cultivated both for subsistence and market(e.g. pepper).

Income from livestock is generated mainly by the sale of animals as destocking mechanism. The reasons that most households do not want to maintain many livestock in their farm is shortage of feed and grazing land. The majority of the farmers did not keep ox(en) for draught power as there is possibility of getting draught power on rent from farmers who give such type of services in the villages.

Coffee contributes the largest share to household income. On average about Birr 4,040.6 was obtained by sample of respondents. About 35% of respondents did not generate income from coffee in the survey season because of the bi-annual nature of coffee(according to the local situation good coffee harvest is every two years). In this case income from turmeric sale plays an important role in filling the gap from coffee and hence contributes for the sustainability of livelihood for the coffee producers. Maize and sorghum are the second important income sources for the farmers inn Yeki woreda.

Table 4 Farm income for sample households in Yeki woreda for the season(2008)

Source of income	N	Minimum	Maximum	Mean	SD
Coffee	78	210.00	30000.00	4040.63	5110.56
Turmeric	**95**	**200.00**	**6000.00**	**1461.52**	**1382.10**
Cereal crop production	116	400.00	12000.00	3380.34	2598.83
Livestock	51	200.00	10000.00	3470.59	2339.56
Vegetables and fruits	26	20.00	1500.00	470.07	376.43
Honey production	6	130.00	800.00	275.83	258.04

Source: Own survey, March 2009, n=number of household heads

As indicated in table 4, turmeric appeared important in terms of contribution to households income. For the production season(2008), the sample of households has earned on average about birr 1,461.50 from the sale of turmeric. Maximum

earning was indicated as birr 6,000 and the smallest as birr 200 in the surveyed season.

Turmeric is one of the most important income source for the rural households in Yeki woreda. It contributed on average about 18.6% of the total income of sample households in the current production season (2008). The largest share of cash income from crop production is generated from the sale of coffee followed by turmeric. As indicated in the table 4 above, turmeric stands fourth in terms of the contribution to total household income in the production season. It was noted by producers farmers that its role in the household income has decreased for the decrease land and marginal attention given.

The relative share of turmeric to total farm income; turmeric land allocation and turmeric productivity showed variation across farm size groups which is an important social grouping in the area. In fact delineation of social groups based on relative wealth status was found very complex and problematic. Because it depends on many other attributes which have qualitative nature and the description varies across different communities considered for this study. Farm land holding size was used as common factor to group farmers in all the study sites. During FGD session farm holding size categorization was conducted in with farmers. Based on relative land holding size farmers identified three farm size categories. Accordingly farmers were identified as large farm size holders when they own more than four hectares by a family unit. Those farmers who own between two and four hectares were considered as medium farm size households while those who own less than two hectares were identified as small size farm households.

Table 5 Turmeric income, land allocation and productivity by farm size groups of sample households in Yeki woreda.

Household status	Share to total income(%)	Land allocation (%)	Productivity (qt/ha)
Large size farm	21.5	7.3	72.2
Medium size farm	18.7	7.9	55.7
Small size farm	17.0	14.7	72.5
Total Mean	18.6	8.6	65.3

Own survey, March 2009

As indicated in table 5, the share of turmeric to total income was greater for medium and large size farm groups. Turmeric contributed on average 21.5%, 18.7% and 17.0% of the total income of large, medium and small farm size groups respectively. Even though the small land holders have allocated higher proportion of their total land to turmeric, it did not compose the highest income share as they usually sale immediately after harvest and did get the lowest market price. This indicates that the poor is also poor to get the best of market opportunities. The large and medium farm categories share of turmeric to total income is higher even though they have allocated lower proportion of their total land to turmeric as a result of harnessing better prices in the market.

Land allocation and turmeric productivity also showed variation across the farm categories as indicated in table 5. Large farm size groups allocated a sizeable land to turmeric(7.3% of the total land they own) and maintain higher income by improving their efficiency of harvesting by employing hired labor and share-cropping out early in the beginning of harvesting. Medium sized farm owners have low proportion of turmeric in their total income when compared to large farm groups mainly because of the limited land they possess and smaller share of the land they allocated for turmeric(7.9%). Small farm size farmers allocated higher proportion(14.7%) of their total land to turmeric in the survey year which is the largest share of land to turmeric when compared to the other two groups.

This is because they are constrained by other factors of production such as improved maize seed and fertilizer purchase. As a result they prefer to produce turmeric which requires none of the external inputs except their labor. For this reason turmeric is considered by the majority of the farmers as resource poor farmers crop. It is also one of the no risk crop in terms of disease, pest, crop failure and wild animal attack.

In addition to the lower proportion to total income, the value of income generated from turmeric sale also shows variations across farm size groups. About 31.6% of the respondents earned cash income from turmeric sale from birr 500 to Birr 1500 while 44.4% of the respondents earned cash income of less than birr 500 in the survey season from turmeric production. Among the lower earners from turmeric sale, about 48.1% of them are from small farm size households of the community (table 6). From the sample of respondents only 13.7% of them earned cash income more than birr 2500 from sale of turmeric while 10.3% of them earned cash income ranging between birr 1501 and 2500 from turmeric sale. Income level lower than 500 birr was generated largely by small farm size holders(table 6). Respondents earning income more than birr 2500 were from medium and large farm size holders. As it can be seen from table 6 below, the proportion of small farm size holders in higher income level of turmeric is very low when compared to large size farm holders.

Gender has also important implication on the income level earned. Since turmeric is labor intensive and female headed households face the challenge of labor shortage their income from turmeric is low. Usually female headed households rent out their land and sharecrop out turmeric for harvesting and processing which reduces their income from turmeric by half. As it can be seen from table 6 below, major proportion (11.5%) of women household heads have earned from the lowest turmeric income category(less than 500 birr).

Table 6 **Turmeric income and farm size groups for sample households in Yeki woreda, 2008**

S/n	Turmeric income generated(birr)	Proportion of sample households in each income category(%)	Household groups based on Farm size			Gender difference(%)	
			Small farm(%)	Medium farm(%)	Large farm(%)	Male	Female
1	Less than 500	44.4	48.1	34.6	17.3	88.5	11.5
2	Between 500-1500	31.6	37.8	45.9	16.2	94.9	5.1
3	Between 1501-2500	10.3	33.3	50.0	16.7	100	0.00
4	More than 2500	13.7	12.5	43.8	43.8	94.1	5.9

Own survey, March 2009

The average productivity of turmeric for the sample of households interviewed is very low compared to its potential(290-310qts/ha)[1] and average woreda agriculture office estimate(150qt/ha). The productivity of turmeric has also showed variation across different farm size groups. As indicated in table 6 above, large farm holder groups have higher productivity of turmeric (72qt/ha) while medium farm size groups have low turmeric productivity per hectare(55.7qt/ha. Lower turmeric productivity of medium farm size farmers in the study area indicates that those farmers area constrained by labor because of completion from other crops forced them to marginalize turmeric management and even harvesting. Lower productivity of turmeric for medium farm size holders is also attributed to poor management practices(planting density and weeding) and harvesting efficiency as they depend on hired labor. Large farm owners usually sharecrop out turmeric farm for landless farmers for harvesting and keeps their har-

[1] Turmeric yield at Teppi research station

vesting efficiency high. In general farm owners productivity is said to be lower for all the combined effects of low plant density, poor field management before and after planting as well as lack of effective supervision.

It was highly pronounced during the FGD by the producers farmers that turmeric is a tedious and labor consuming business. On the other hand, Even though farmers complain about the tedious and difficulties of turmeric production with the available traditional technologies, the social value of turmeric was greater than the economic value. Farmers attach higher value for the money they obtain from turmeric than from sale of coffee. Why? They think that we have put much of our labor in it and it is blessed. They also think that it is our real effort without the use of commercial inputs. They think that everything they buy with income from turmeric will be sacred. They usually use money generated from turmeric to buy cows and sheep. Some of the farmers used to pay for land rent expecting that the land will be more productive. Extension experts in the area used to explain the probable reason why farmers gave higher value to the money they received. Farmers gave higher value because they sell turmeric when they have cash shortage after coffee sale.

4.3. Access to Farm Land and Relative Allocation for Turmeric

4.3.1. Mechanisms of Access to Farm Land

The majority of sample respondents(97.5%) have their own farm land on which their livelihood was dependent. Farmers in the area have different way of land accessing mechanisms which is the typical feature of cash dominated farming systems. The mean land holding of sample households was 3.07 hectares per household(table 7). The range in land holding size was very wide in that an individual possesses about 12.5ha while other farmers work on less than one hectare.

Table 7 **Land size and access to farm lands**

	n	Mini-mum	Maxi-mum	Mean	SD
Total land owned by the family(ha)	114	0.04	12.50	3.07	2.13
Number of separate plots	118	1.00	14.00	4.64	2.43
Land cultivated from rent	27	0.01	2.00	0.31	0.40
Own land cultivated	111	0.04	11.00	2.76	2.08
Land cultivated by sharecropping	45	0.01	4.00	0.89	0.93

Source: Own survey, March 2009

For those farmers who need additional land there was a possibility of renting in or sharecropping from other farmers. Those who have land in excess or holder who cannot work on it usually rent or sharecrop out their land for one to five years. Share cropping was more common than renting of land in the study area that may be related to land tenure security issue. On average 0.31ha of land was rented in by the farmers while 0.90ha was shared in for crop production purposes. Because of the presence of renting and sharecropping from different sources, farmers have owned different size plots in different locations. On average a household has possessed and worked on 4.64 different separate parcels. Some farmers who established living in the town centers used to rent in land and sharecrop out the land again. Renting and share cropping is the mechanism used by farmers who need additional land and young immigrants to the area to access farm land. Famers who need additional land are usually those farmers who want to increase their turmeric production and to participate in the production of new maize varieties being introduced. Under the current situation only new comers to the area from other parts of the country usually rent in and start turmeric production business as an entry point to farming as sharecropping also need familiarity with the society.

Landless and capital constrained farmers have also a mechanism by which they can share production without access to cultivated land. This was harvest sharing for their labor contribution. This is a mechanism to get the produce without the need to allocate and cultivate one's own land. Turmeric and coffee harvesting usually shared out by the owners in this fashion to be harvested by laborer farmers. The share cropper gets about two-third to one-third of the produce in the case of turmeric when labor is very scarce and turmeric price is very low in the market. In addition the good harvest year of coffee production and higher coffee price affects total volume of turmeric harvested in the area. The status of coffee also determines the proportion of share croppers share. When the price and yield of coffee increased, the volume of turmeric produced in the area decreases. The share of turmeric sharecropper increases to two-third as both coffee and turmeric compete for the same labor in the area. For example in 2007 ,the share of the harvester was two-third of the total and the owner gets only one-third of the total produce. This was because coffee yield and its price was high in the same year. On the other hand in the current production season(2008/2009) the share of the harvester declined to less than half of the produce. But most farmers did not share crop out turmeric. When compared to the previous year, in 2008/2009 higher volume of turmeric was harvested as a result of very low coffee production in the locality.

4.3.2. **Relative Land Allocation and Pattern of Land Use**

The land use pattern can be described as coffee dominated farms located away from the settlements and close to the natural forests. But fruits, vegetables and several types of retained tree species are found around homesteads. For the majority of the inhabitants cultivated land for food crops are next to the home garden for the risk of wild animals.

Farmers in the study area usually produce diverse types of crops both for con-

sumption and sale(NTPF, 2006). Maize, sorghum and taro are produced mainly for consumption while coffee and turmeric are primarily produced for market. Farmers relative land allocation for these crops is influenced by their importance to household income, market value and nature of the crop (annual or perennial). As a general remark in the study area land reallocation decision is not a frequent phenomenon as the majority of the crops produced are permanent crops.

Table 8 Land allocation for different crops in the cropping year, 2008

Household status based on land holding	Mean land allocation for crops per household heads(ha)				
	Maize	sorghum	coffee	Turmeric	Taro
Small farm size	0.41	0.39	0.57	0.158	0.019
Medium farm size	0.80	0.78	1.69	0.289	0.092
Large farm size	1.32	1.32	5.72	0.365	0.065
Total mean	0.75	0.74	2.08	0.252	0.053

Source: Own survey, 2009

The mean land allocation for coffee in the study area was 2.08ha while for maize and sorghum it is about 0.75 and 0.74 ha respectively. Farm land for Maize and sorghum was the same for the reason that sorghum is planted on maize field after maize harvesting in August(i.e., double cropping). According to the farmers in the study area, land for maize and sorghum seldom changes. It retained the same plot for more than five years and as a result the fertility of the soil is declining. Now maize production has required them commercial fertilizer which was not a common practice in the area in the past. The average land allocation for turmeric is about 0.25ha(table 8). Turmeric also maintains the same plot size for more than 10 years for some of the farmers. Taro occupied the smallest plot in the farmyard and is not produced by the majority of the farmers but it is used to fill the food shortage months. It is grown around homestead and along rivers as wild plant.

As indicated in table 8 above, the actual land size allocated for turmeric showed variation across farm size groups. Large farm size farmers allocated 0.36ha in the 2008 production season while small farm sized households allocated about 0.158ha in the same production season. Even though turmeric is viewed as a resource poor farmers crop, farm size determines its significance in the total share of poor farmers income. Therefore a strong effort should be made to enhance the productivity and market situation to benefit the poor with the available limited land.

4.4. Trend of Turmeric Production in Yeki Woreda

Turmeric production in Yeki woreda is currently considered as the most problematic crop both from the farmers and agricultural officers view. The volume of turmeric production and area allocated per farm household for the last 10 years has shown a general declined and especially for the last three years it has experienced rapid shrinking. Poor marketing incentives (low and unstable prices) were the major reason for the producers to look for other alternative crops. Local level traders also complain the low return to their turmeric business as the result of deteriorating quality of turmeric in the area. Turmeric producers farmers have responded to the prevailing problem by decreasing their turmeric land and shifting their labor to other crop production. Its productivity was also found very low owning to its marginalization in field management and harvesting inefficiency. At present displacement or replacement by other competing crops and interruption of turmeric production are the features of turmeric production in Yeki woreda. Displacement by other crops is based on the relative price of competing crop in the market.

During the key informant interview and focused group discussion, it was found out that the general situation for turmeric production in Yeki is declining. But the production volume, land size and participating farmers record of the woreda agriculture office shows an increasing trend for the last five years. The argument of

this section is therefore whether turmeric production is increasing or decreasing in the area. It will be discussed based the household survey data and other secondary data available. Considering the limited availability of data on spices in general and turmeric in particular, I heavily relied on the survey data generated for this study and some other secondary sources.

Displacement by other crops, experience of interruption of turmeric production and trend of land allocation over the last ten years were used as a direct measure for the decline in the production trend for the last ten years. Data from secondary sources on the volume of turmeric traded out from Yeki woreda and trend of turmeric contribution in the export sector were also used as an indirect way for confirmation of the reality at the ground. In addition a close recalling method was used to get additional information on the trend of land allocation and change in volume of production. The production level and land allocation change of turmeric for the last ten years(1998-008) at an interval of five and average volume of production per household for the last three years(2006-2008) was collected from the sample of respondents considered in this study.

4.4.1. Displacement of Turmeric by Other Crops

Based on the discussion held with farmers in the study area, turmeric is being replaced by maize ,sorghum and coffee plantations which are termed competing crops here after for turmeric in the area. The reasons for the faster change in the production pattern was imposed by low price given to turmeric and shortage of labor to cultivate and partially process turmeric. But on the other hand the prices of food crops such as maize and sorghum has increased incidentally. This has motivated the farmers to reallocate their resources(land and labor) for maize and sorghum which has direct impact on turmeric production by the new land reallocation decision of farmers.

As indicated in table 9 below, prices of maize, sorghum and coffee has increased significantly while the price for turmeric keeps on declining for the years indicated in the table. The price of turmeric has declined by 95.7% when price in 2009 is compared with the 1997 turmeric price. The price of turmeric has also declined by 64% when the 2009 price is compared with the 1999 turmeric price just in ten years time. On the other hand, the price of maize has increased by 252% when compared to 1997; sorghum price has increased by 208% when compared to the 1999 price. Price of coffee has also increased by 94% when the 2009 price is compared to the 1999 coffee price. The trend of increase in price for the three crops is straight while for turmeric it fluctuates.

Table 9 Turmeric and other crops[2] price(birr/kg)

Year	Maize	Sorghum	Coffee	Turmeric	Relative price		
					Turmeric/maize	Turmeric/sorghum	Turmeric/coffee
1997	0.91	-	-	49.7	54.62	-	-
1998	1.01	-	-	46.1	45.64	-	-
1999	0.97	1.05	3.57	5.9	6.08	5.62	1.65
2000	0.75	0.74	2.92	0.75	1.00	1.01	0.26
2001	0.81	0.89	4.90	6.41[3]	7.91	7.20	1.31
2002	0.60	0.63	1.99	2.85	4.75	4.52	1.43
2003	1.09	0.91	1.95	0.64	0.59	0.70	0.33
2004	1.08	1.13	3.68	3.09	2.86	2.73	0.84
2005	1.18	1.19	6.31	1.64	1.39	1.38	0.26
2006	1.21	1.29	6.36	2.18	1.80	1.69	0.34
2007	1.26	1.46	6.53	1.51	1.20	1.03	0.23
2008	2.67	2.84	8.95	2.30	0.86	0.81	0.26
2009[4]	3.20	3.23	6.90	2.13	0.67	0.66	0.31

Source: CSA data base(1997-2008) on agricultural producers price - data not available

The relative prices of turmeric in terms of other crops indicated in table 9 above, shows that 54.62kg of maize was required to buy a kg of turmeric in 1997 when compared to 0.67kg of maize in 2009 to buy a kg of turmeric. This is a drop of 99% of the maize required in 1997. It implies the price of turmeric in terms of

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[2] Prices used in this table are for red sorghum type, unmilled turmeric and whole coffee. All prices are at the national level

[3] The price is for flour turmeric(local)

[4] Average price of the last six months is used

maize has fallen sharply. Two years later the amount of maize required to buy one kg of turmeric in 1999 is compared to the 2009, it has declined by 89%. In the same way 5.62kg of sorghum was required to buy a kg of turmeric in 1999 which is now only 0.66kg. It has decreased by 88% when compared to 1999. When the relative price of turmeric and coffee is compared in 1999, a kg of turmeric was bought for 1.65kg of coffee. But in the current season(2009) only 0.31kg of coffee is required to buy a kg of turmeric which is a drop of 81% coffee amount required when compared to 1999.

It is very clear from the discussions made above based on relative price movements of maize, sorghum and coffee that farmers seem rational to opted for replacement of turmeric by one of the crops. So it is very clear that the price of turmeric was one of the important factor for the fast displacement of turmeric in the area.

Turmeric price is also highly variable and have no pattern across months and over years. As it can be observed from the table 10 above, mean price of turmeric has dropped from 49.75birr/kg in 1997 to 2.85birr/kg in 2002 and 2.13 in 2009. The sudden drop in the price of turmeric has forced most of the farmers to discontinue turmeric production in the area at least for some years until the price stabilizes.

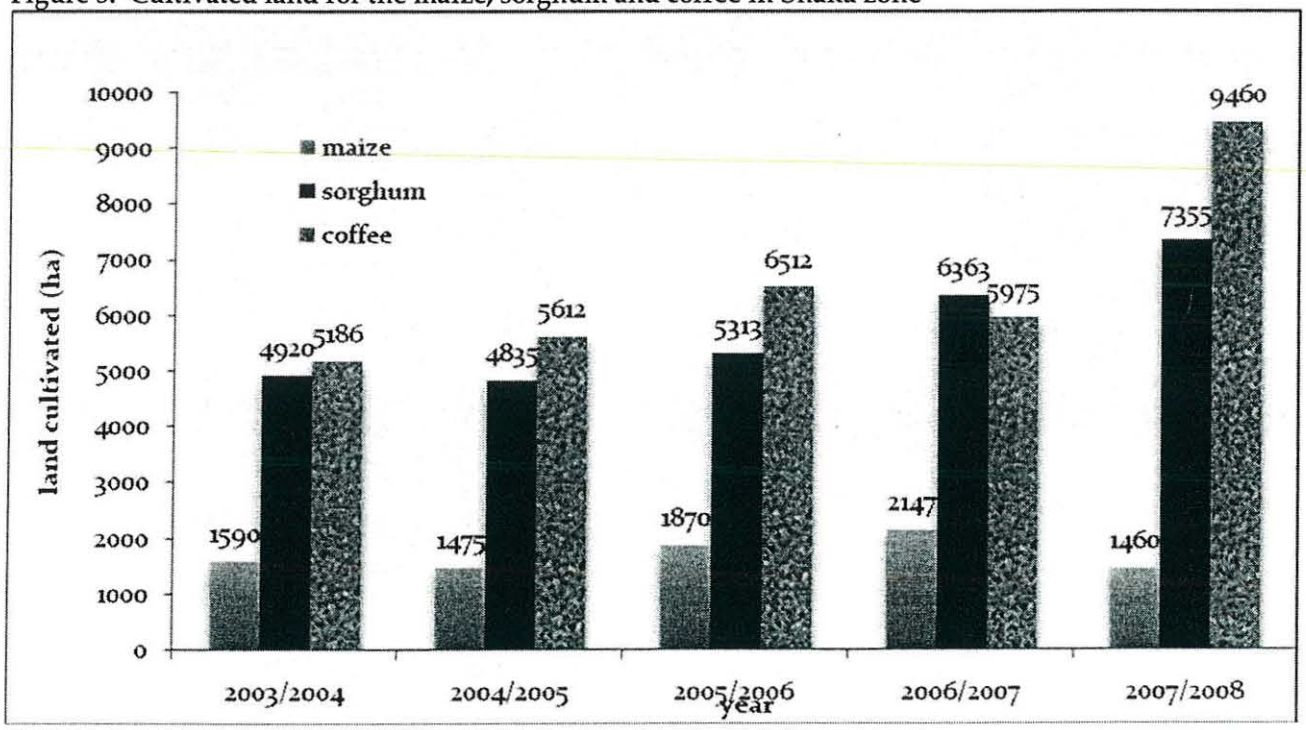
The rate of displacement of turmeric by maize and sorghum was found very fast in the recent three years(2007 onwards) as the prices of these crops have increased significantly over this periods related to the recent global food price escalation.

Young and progressive farmers were seen quickly shifting turmeric farm to maize in the study area. Even though the basic reasons of replacing maize for

turmeric was mentioned as low prices given to turmeric, the concerted maize extension services available in the area have also aggravated the process of displacement. Agricultural extension agents are promoting improved maize varieties, commercial fertilizer and row planting pattern of maize to the area has encouraged farmers to quickly displace turmeric. Those older farmers and labor constrained family usually replace coffee for turmeric as it demands less labor and less competition with wild animals which is the major treat to food crop production in the area.

Increasing trend of total land cultivated for maize, sorghum and coffee in the study area(Shaka zone) for the last five years(2003-2008) can be also taken as an indirect indicator of land completion among these crops. As indicated on the figure 3 below, total land cultivated in the zone has increased steadily. Plantation of coffee has increased significantly in the consecutive years.

Figure 3. Cultivated land for the maize, sorghum and coffee in Shaka zone



Source: CSA, Agricultural sample survey (land utilization Report 2003-2008),

4.4.2. Interruption or Discontinuity of Turmeric Production

Another important feature of turmeric production in the study site is interruption or discontinuity of turmeric farming. This is also used as an indirect proxy to see the trend of production from farmers experience. Interruption or discontinuity of turmeric is understood as the decision of farmers not to harvest for market. It is not the same as other annual crop discontinuity which means in that case complete abandonments of the crop from the field. According to the result of household survey(see table 10), among the sample respondents 63.3% of the farmers have experienced interruption of producing turmeric since they have adopted the crop during the last ten years. On the other hand only 36.7% have maintained production of turmeric year after year regardless of the fluctuation in the prices.

Farmers in the study area used to harvest turmeric based on the signal from market about prices. Otherwise if price is below their minimum expectation they postpone harvesting for next season. This means turmeric production is strongly corresponds to harvesting and it does not necessarily start from the decision of cultivation and planting. The most important reasons of interruption or discontinuity were listed by farmers as lack of attractive market; labor shortage and lack of improved production skill by 79.2%, 16.9% and 2.6 % of the respondents respectively.

With regard to land allocation over the last ten years 38.7% of the respondents have indicated that their trend of land allocation for turmeric have decreased compared to the size they have before 10 years. Only 15% of the farmers have indicated that they have increased their turmeric farm while 32% have maintained constant and 13.4 % experienced inconsistency of turmeric farm size (increasing and decreasing).

Those farmers who experience interruption have decreased turmeric land in 78.3% of the cases (table 10). On the other hand those farmers who have increased land were those farmers who maintained production continuously since they have started.

Table 10 Relationship between land allocation trend and experience of discontinuity

Land Allocation trend	Experience of interruption		Total
	Interrupters %	Non interrupters %	
Increasing	38.9(7)	61.1(11)	15.0(18)
Decreasing	78.3(36)	21.7(10)	38.7(46)
Constant	53.8(21)	46.2(18)	32.0(39)
Inconsistent	75.0(12)	25.0(04)	13.4(16)
Total	63.3(76)	36.7(44)	

Source: Own survey (March 2009) *numbers in parenthesis indicate number of respondents

For farmers experiencing decreasing trend in land allocation the principal causes were listed as decreased income from turmeric (36.2%), shift to other food crop (36.2%), lack of turmeric buyers (23.4%), and decrease in productivity of turmeric (4.3%).

With regard to the future plan of turmeric production by farmers only 29.2% of the respondents have indicated to increase production with the pre-condition that the price will increase. On the other hand 35.8% of the respondents have indicated that they will decrease and 30.85% of them will maintain their turmeric farm whatever the price may be. Currently, about 60% of the sample respondents used to produce turmeric as major crops with equal attention as other crops. In other words about 40% of the respondents have indicated that turmeric is currently produced as minor crop because of its decreasing trend to household income contribution.

Another empirical data collected in this survey about the land allocation and volume of production change reveals the same pattern of decreasing trend in production. Change in turmeric farm land is slow because it requires at least one extra year to get rid of all the left over crop. But change to the volume of production is based on the intensity of harvesting. So it is quick and observable in three years data. To detect the changes in land allocation five years interval information on land size was collected from the sample households for the years they have good recall memory (i.e., 1998, 2003 and 2008). Turmeric yield for three consecutive years (2006, 2007 and 2008) was collected to trace change in the average quantity of turmeric production per household heads in the study site. As it can be shown in table 11 below, average production has declined very sharply in the years indicated from 12.06qts in 2006 to 8.82qts in 2008. But farm size did not change significantly during the short periods. The farm size has changed significantly for five years interval and relatively remained constant for the consecutive years. It was also clear from the discussion made so far and the information contained on table 11 below that production volume did not necessarily related to land size. It is rather related to the harvesting capacity.

Table 11 Average Land Allocation and Production Volume of Turmeric by Sample Households in Yeki Woreda

Years	Mean Area per household(ha)	Mean dry turmeric per household(qt)	Change over 1998 production (%)
1998	0.24	13.71	-
2003	0.29	13.42	(2.12)
2006	0.27	12.06	(12.04)
2007	0.26	11.41	(16.78)
2008	0.27	8.82	(35.67)

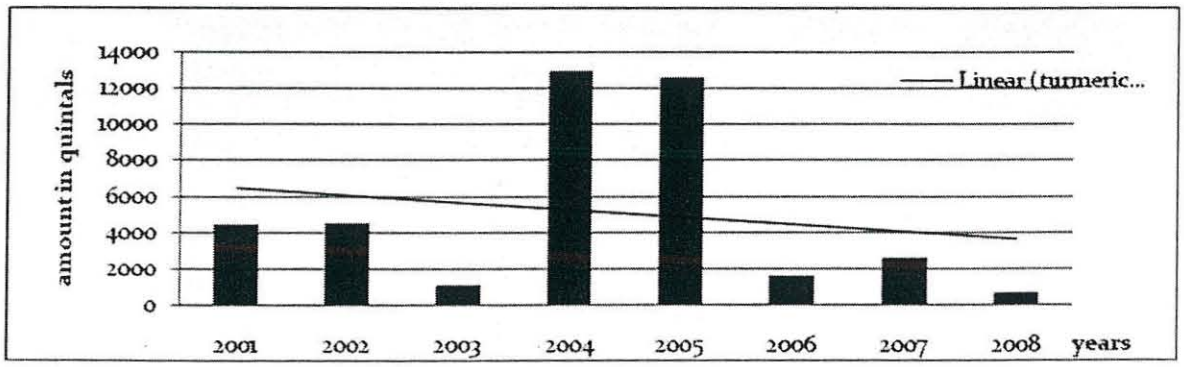
Source: own survey, March 2009 ; numbers in brackets are negative

The piece of information contained in the following table 11, confirms that in the last ten years there is a decline of turmeric production per household in the study

area. Especially for the recent consecutive years(2006-2008) the drop in production is sharp and significant. As it can be seen in table 11, the drop in amount of production per household for the year 2006 over 2003 is about 12.04% and for the year 2007, it has declined by 16.78% over 2006. The decline of average amount of harvest for year 2008 is 35.67% which is the radical and significant reduction compared to 1998 production as a base year. The information contained in table 11 above in general indicates the decline if turmeric to household income and average turmeric product channeled in the market.

Another way of investigation of turmeric production status in Yeki woreda is looking at the trend of total quantity of turmeric channeled to central market from Teppi town. The assumption is that insignificant amount of turmeric is locally consumed, and therefore the majority of the produce goes to the market. Teppi town is the largest turmeric market in the southwestern Ethiopia and also Yeki woreda is the major turmeric producer in the region. With this understanding it is possible to locate the status of turmeric production in Yeki over the specified duration. Based on the quantity of turmeric delivered to central market for the years between 2001 and 2008, the trend of production is declining as it can be observed in the following figure 4. The trend line fitted also shows a declining trend which signifies there is a decrease in production.

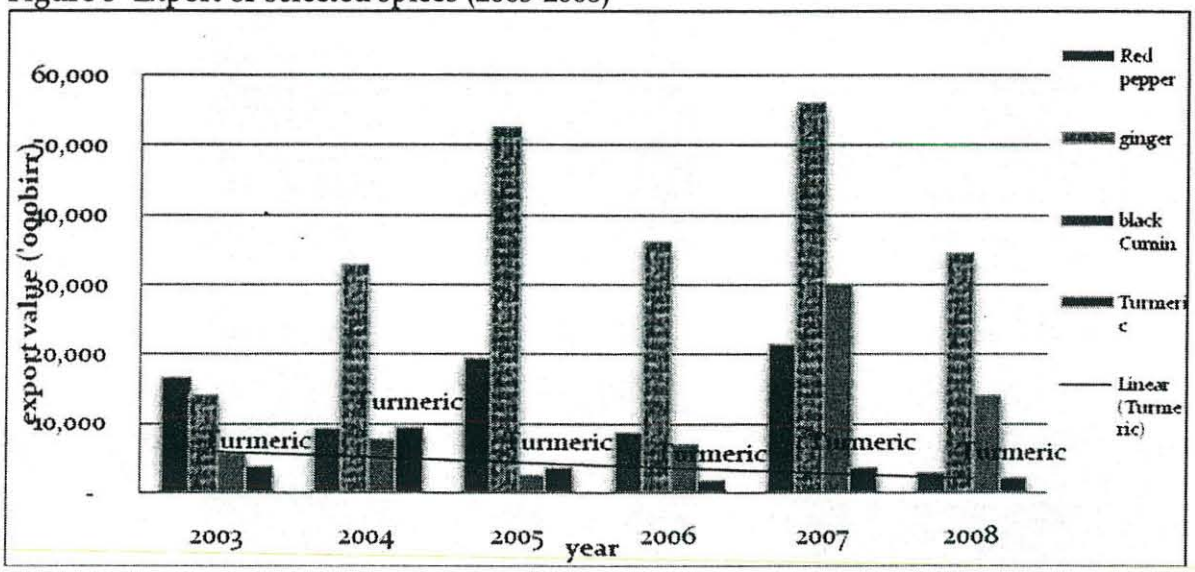
Figure 4 Turmeric Delivered to Central Market from Yeki Woreda



Source: Marketing department of Yeki Woreda Agri. and development office, 2009

Teppi being the hot spot area for turmeric production in the country can influence turmeric export at the national level also keeping other things insignificant such as domestic consumption and illegal export. Therefore, the decreasing trend of turmeric production in potential areas (such as Yeki woreda) can be extracted from the decreasing trend of export value for the durations of 2003 to 2008. As indicated in figure 5 below, the contribution of turmeric to export value has attended a general declined for the years 2003 and 2008.

Figure 5 Export of selected spices (2003-2008)



Source: RCBP, 2008 and MoARD(Agricultural marketing and input department)

But the reports of Yeki Woreda agriculture and rural development office indicates an increasing trend in terms of production volume, area of land cultivated and number of farmers participating in turmeric production for the specified period(table 12). The finding of this study and report of the agriculture office on status of turmeric production in Yeki woreda are not consistent in terms of the trend of production and land occupation. In this study displacement by other crop, interruption of production by farmers and the reduced volume of turmeric delivery to central market were used to detect the trend of production in the woreda. There is also wide variation in productivity record of turmeric among

the research station center, woreda agriculture office and this study result. The explanations for low turmeric productivity according to the result of this study are plant density as farmers did not plant according to the recommendation; poor field management because of unattractive price and poor harvesting efficiency. Farmers experience in the trend of land allocation over the last ten years and farmers' future plan shows a decreasing trend (see table 10 above). A significant proportion of the sample households have indicated that turmeric production is currently considered as minor in the current livelihood activities.

Table 12 Area, Yield and farmers in turmeric production in Yeki woreda (2004-2008)

Year	Production(qt)[5]	Area cultivated (ha)	Number of household heads participated
2008	98,700	658	2,745
2007	97,500	650	1,760
2006	90,900	606	1,700
2005	67,800	452	1,808
2004	31,200	208	1,800

Source: Yeki woreda agriculture and rural development (2004 – 2008), 2009

[5] Woreda agriculture and rural development office considers the productivity of turmeric 150qt/ha to estimate production for each year.

4.5. Practices, Changes and Challenges of Turmeric Processing by Smallholders in Yeki woreda

Turmeric processing is one of the hardest of all operations and is very distinct for turmeric. Processing of turmeric at household level has undergone many changes in terms of the operations and handling. The contributing factors for the changes are cited as decline of turmeric price, increase in volume of production per household and marketing practices. The rate of changes in the way turmeric processed over the last ten years was also aggravated. The changes in processing have affected the quality of turmeric delivered to the market.

The important partial processing steps of turmeric were sorting and washing the mud, boiling, drying, rubbing against rough surface and storing the produce before sale. These practices after harvesting were tedious and sequential activities demanding high labor input. These activities are mandatory from the quality point of view. Before ten years, farmers used to prepare fresh turmeric juice with lemon juice. They spread the solution on the rhizomes to make it yellow. This practice is a replacement activity for the practice of polishing the rhizomes against rough surface to make the inherent yellow color. Farmers have modified the processing of turmeric in response to the low price given, large volume produced per household and labor shortage.

Traders complain that application of coloring solution has brought deterioration of quality as some farmers were seen to color without boiling. Traders fail to differentiate the boiled turmeric from the other. For some of the farmers coloring becomes mechanism to avoid the burden of boiling and drying which in fact have serious implication for quality deterioration. As a result buyer/trader in Teppi town has stopped buying colored turmeric from farmers instead they buy

the dried turmeric after checking physical impurities. They used to color in their warehouse before they export to the central market.

The major operations of turmeric processing can be sorted into four steps. All steps are required from quality point of view. Farmers use very traditional and labor intensive techniques to process the raw products of turmeric. The traditional method of processing turmeric requires materials like open barrel, spade, fire wood and water.

Step 1: Cleaning the Rhizomes - this is done following harvesting in December and January so as to make turmeric free from soil. In the mean time roots are also removed from the rhizomes.

Step 2: Boiling the Rhizomes- it requires about 45-60 minutes for boiling. Short and open barrel filled with water will be put on burning flame to boil the water. The turmeric is filled in the water. More fuel wood is added to produce more and more heat. The rhizomes are turned over and over continuously with spade. Rhizomes are spread on a prepared material. All the harvested turmeric rhizomes are boiled in the same manner. Farmers use many sets of barrels at a time. Farmers have labor exchange called *Dado* especially for boiling. They usually rent in barrels for 12 birr per day. Boiling one set of barrels for 45-60 minutes is called locally '*tidosh*'. One farmer can have on average about 250 '*tidosh*' per season. To carry out the operations safely, farmers do the boiling at night, when the weather is cool.

Step 3: Coating the Rhizomes- Farmers grind uncooked turmeric rhizomes with mortal ('mukecha') and pestle. They mix the grinded turmeric juice with lemon juice and apply on the boiled rhizomes. The purpose of coating turmeric with such solution is to produce the yellow color of the turmeric and to protect the rhizome from weevil attack and increase storage time. This step of adding solu-

tions on rhizomes is a value adding mechanism for farmers. This process is not currently practiced by farmers as traders have resisted buying such coated turmeric rhizomes. The big traders are processing by themselves at their warehouses after they buy the dry rhizomes from farmers. This has its own implication for reduction of price.

Step 4: Drying- the coated rhizome is left to dry by spreading on the ground and turning it over and again. On average the drying time can take about 15 days and can also extend to a month depending on the existing weather condition.

It is recognized that the quality of marketed turmeric has deteriorated in the woreda since the last ten years. There is an intervention from the extension offices on the quality improvement. But this intervention is not appreciated by the majority of the farmers. Farmers suspected the acceptability and wider adoption of turmeric quality improvements. Woreda agriculture office via farmers training center (FTC) has started to train on the quality improvement of turmeric and adoption of improved implements. They are trying to promote the following package technologies:

- improved varieties
- drying of turmeric on raised bed or on wire mesh
- Use of polishing drum/decorticator to clean and remove the corky outer cover of turmeric.

But farmers were not willing to adopt the new variety as they consider variety was not their priority problem and they also resisted the use of raised bed and wire mesh to dry the produce because of the bulky nature of turmeric and additional cost incurred family labor shortage and increased labor cost. Farmers did not ignore the importance of using the decorticator or polishing drum for removing the unwanted upper rough surface and improving the appearance of turmeric but they demanded a price that motivates them to do so. The cost of ob-

taining the drum (about 2,000birr) was also found unaffordable for them with the current market price of turmeric. If the push from extension workers on use of the machine and raised bed drying of turmeric continued, farmers preferred to discontinue turmeric farming as some farmers did it already. So, the intervention has a potential to facilitate the interruption of turmeric production in the area unless linked to the market. Farmers are conditional in the use of polishing machine and continue to produce turmeric if they are secured alternative potential buyers with the acceptable floor price as guarantee. Farmers foresee contract farming for company or known buyers of the produce as long term solution.

It is very clear from the arguments that while promoting technologies to the user it is very important to consider the real benefits that go to the farmers using that technology and compatibility to the changing marketing situations in the farming systems and in addition the technical acceptability of the solution for the target.

4.6. Turmeric Technologies and Dissemination Practices

4.6.1. Turmeric Varieties in Use

Farmers have identified three cultivars of turmeric they used to produce based on the size of the rhizomes. Farmers categorize these cultivars as large, medium and small size as different 'varieties'. Large rhizome sized turmeric cultivar is named locally 'boffee'. Farmers identification and evaluation criteria for these 'varieties' were expressed in terms of yield; boiling time; days to dry (less than 15 days); stability of weight after drying and appearance (deep yellow color). In this respect they want to avoid the 'variety' they call *'boffee*[6]*'* as it loses high proportion of weight after drying. Farmers appreciate *'boffee' variety* for its capacity to improve the soil fertility. Smaller rhizome turmeric was the most preferred type by farmers as it losses minimum weight upon drying. More than 85% of the farmers want to use the smallest size cultivar in their farm. The evaluation attribute for the variety were ranked and accordingly minimum weight loss as the first and important characteristics and high yield as the second best attribute of turmeric variety selection for the farmers (table 13).

Table 13 Preference ranking of the respondents for best attribute of the 'variety'

s/n		Rank
1	Deep yellow color	3rd
2	Minimum weight loss after drying	1st
3	Quick to dry(less than 15 days)	4th
4	High yield	2nd
5	Quick to boiling	5th

Source: own survey ,March 2009

About 98% of farmers know that three 'varieties' of turmeric exist in the locality and 56.6% of them have used two of them and 33% of the farmers used only one

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[6] *Boffee* is naming by farmers for turmeric variety in the village.

cultivar in their current production system. Two varieties with the code of *Tu48/72*[7] and *Tu51/72* were recommended for southwestern by Teppi research centers after quick adaptation study (Girma et al, 2008b). These varieties are the ones distributed and used by the farmers in Yeki woreda. They were not named during the initial dissemination as result farmers cannot identify their names. Because of the respective advantages of each cultivar farmers prefer to maintain the mix of them on their farms.

4.6.2. Agronomic Practices used in Turmeric Production

Even though agronomic practices such as planting pattern, spacing, fertilization and processing technologies were recommended, farmers are not using these practices in their farming practices Turmeric is produced as sole crop on the farm and only very few farmers have intercropped with other crops. Rotation of turmeric with maize was commonly practiced as farmer's view that turmeric improves soil fertility. About 92.4% of the farmers use sole cropping pattern and 4.2% used rotation with maize and sorghum farm and 3.4% experienced intercropping with maize. Farmers indicated that turmeric improves soil fertility and as a result which needs to be confirmed by research. Farmers have strongly indicated the need and importance of technologies with regard to turmeric intercropping and rotation if turmeric is to withstand land competition.

Source of planting material for farmers was not a problem in turmeric production as farmers use their own stock year after year. Those farmers who want to start new farm, they can get from other farmers in the village. Based on the survey result of this research 69.2% of farmers have indicated that they have used their own stock and about 30% have used from other farmers as a source of

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[7] Identification codes for the varieties; Tu48/72 variety is renamed as 'Dame 'after registration in national variety registry

planting materials. Planting material is not a problem for turmeric producers. After harvesting turmeric the remaining rhizomes in the soil grow spontaneously when moisture is available. Therefore in most of the cases farmers do not establish new farms by new planting rather they adjust the density of plants.

With regard to the opportunity available to produce turmeric in the area comparison of six conditions that favors and disfavors turmeric production were done with groups of farmers. The suitability of soil for turmeric without fertilizer was ranked first as conducive and opportunity for turmeric production in the area followed by the suitability of the weather conditions mainly the rainfall. Availability of planting materials was also considered as positive opportunity for turmeric production. Availability of attractive Market was ranked last and it was considered rather as an important limiting and discouraging factor for the continued cultivation of turmeric in the area.

4.6.3. Institutional linkages: Research and extension

Extension services in the woreda and the study site were organized around farmers training centers (FTC). Three extension workers who have basic training in plant production, animal production and natural resources management were assigned in each of the kebeles. When probing for extension services given on spices and turmeric in particular for the study woreda considered it was found very minimal . The conventional methods of transferring technology and imparting skill such as hands on training, demonstration fields, field days and visit to farm by extension workers were used to evaluate the extension services. It was found out from the response of the majority of the farmers that the extension service was weak and inadequate.

The majority of the respondents (86.7%) did not attend any specific training on either the production or processing of turmeric. Farmers used to depend on their

experience and neighboring farmers to acquire skill in turmeric production. Only 5% of the respondents have participated on demonstrations and field days on turmeric. With regard to extension workers visit to farm with the concern of turmeric, only 35.8% of farmers were advised while 64.2% were not visited at least once by the extension workers or any experts in agriculture. Farmers have no experience of visiting the nearby research and resource centers.

Introduction and adaptation research on exotic and indigenous spice species was coordinated by Teppi and Jimma agricultural research centers(Girma et al, 2008a). The two research centers in collaboration have also recommended turmeric agronomic practices and processing techniques. Teppi research center was established before three decades and the center have focused on generating spice technologies for different agro ecologies including the study area. The center provides services such as variety multiplication and distribution; training of extension workers; advisory service to private and state farms. But the center have weak link with farmers and farmers groups. Most of the farmers in the vicinity of the research station were seen practically unclear about the role of the center and its importance. Among the respondents only 15.8% have visited the center last year (2008) while the rest 84% did not know the research center which is about 3 to 5km from their villages.

Despite the important research activities conducted in the research station, there are no line office and extension experts to work on the technology popularization and linkage activities on behave of the research center. There was also weak link between the neighboring FTCs and other research centers (e.g. rural technology centers). Considering the weak link between research and extension service in terms of creating awareness; building farmer's capacity; and improving productivity of turmeric farmers were asked to evaluate their satisfaction level on turmeric extension services. As a result only 6.7% of sample of respondents have

rated as adequate and satisfactory service while the large majority (93%) have leveled the service is as weak and inadequate to help them improve their production.

4.7. Major Turmeric Production Constraints

The production system of turmeric is affected by several factors. Some of the limiting factors are associated to the nature of the crop while the strongest and discouraging ones are induced externally. During the initial field visit and key informant interview several problems were listed which have direct and indirect impact of turmeric production. Eight problems were identified as an important constraints and each problem was compared based on the severity of its impact on turmeric production. This ranking of the major constraints was conduct with the farmer groups in *Korcha* village in Beko kebele which is the major producers of turmeric and this village is also where turmeric production was started. As it can be seen from table 14 below all problems were ranked based on their relative scores. Lack of attractive market was ranked first as constraint of turmeric production especially for the volume and quality of turmeric.

Table 14 Pair Wise Ranking of Turmeric Production Constraints

Constraints	LD	LB	VR	MK	EQ	SK	EX	FL	Score	Rank
Land shortage(LD)									0	8th
Labor shortage(LB)	LB								6	2nd
Lack of improved varieties(VR)	VR	LB							1	7th
Lack of attractive market(MK)	MK	MK	MK						7	1st
Lack of processing equipments(EQ)	EQ	LB	EQ	MK					3	5th
Lack of processing skill (SK)	SK	LB	SK	MK	EQ				2	6th
Weak extension services(EX)	EX	LB	EX	MK	EX	EX			4	4th
Shortage of fuel(FL)	FL	LB	FL	MK	FL	FL	FL		5	3rd

Source: PRA conducted for this study, March 2009

Labor stands second to market as limiting factor (table 14 above). Elder farmers felt that young laborer joining turmeric farming has declined over years. The major reason for the decline of labor in the area according to the farmers view was

flight of youngsters to non agricultural activities. They think that turmeric is not an activity done by the current generation as it demands patience and physical strength as there is no labor saving technologies available for turmeric production mainly for harvesting and processing. Because of the shortage they used to call up reciprocal labor exchange for harvesting and boiling of turmeric. This type of labor contribution was called *Dado*. They usually boil turmeric near the farm where they can get adequate fuel and water. The time of boiling is during the night to avoid day time high temperature.

Since the cost of hiring labor was high, farmers use either family labor or share-crop out turmeric. Hiring salaried labor by annual wage was also practiced. They usually pay in kind for an adult working on the farm for one year. According to the local situation the average payment was about 400kg of turmeric and 400kg of coffee per year. Farmers do not allocate more than a quarter of land for turmeric mainly as result of high labor cost and unavailability of labor at peak time.

Shortage of fuel for boiling of turmeric rhizomes was also an important and emerging problem. Trees for fuel from around home and backyards have declined and farmers start facing the problem. Farmers have indicated that by the time they run out of fuel sources, they will stop completely producing turmeric unless alternative technologies are available. Under the current situation land shortage was not rated as a serious problem for turmeric producers.

Farmers complain the high fuel demand of turmeric to properly boil turmeric rhizomes and they associated the problem with the decline of forest resources in their area. They asserted the cost of fuel would be more than the value of turmeric, had fuel is not obtained for free from their farm. So, one of the reasons that turmeric production declined in the area was also related to the decline of

forest resources. In line with this fact farmers have indicated the need to have technologies that replace boiling by fuel wood and drying mechanism.

Chapter Five

5. Turmeric Marketing Practices and Marketing Information

5.1. Dynamics and features of Turmeric Marketing

Turmeric marketing in Yeki has undergone many changes since the production has started in the area. Changes in market place, number of collectors/buyers, prices given to the produce and selling time were among the major changes. Before ten years turmeric was sold in open local market as well as in big markets in Teppi town. But under the current system turmeric is not sold in the local market and even turmeric not taken to any market places for sale by farmers. The appearance of many local collectors has changed the way turmeric is marketed today. The change of market place and marketing system for turmeric for the last 10 years was induced primarily by the frequent failure of farmers to get buyers and appropriate prices after they took the produce to market centers. In Teppi town there are less than five traders known as buyers and exporters of turmeric from Teppi and participate in turmeric market through their commissioned agents before ten years ago. But now these big traders do not send agents to local markets rather collector traders have replaced commissioned buyers at the local level. The collectors who destined to Teppi market sale in turn to these big buyers. The collectors have the upper limit of price from the bigger traders so that they can manipulate the price that goes to the producers. These collectors go to the villages and collect the produce in two ways. One way is to buy at the road side in the village and the other method is they will be informed by the farmers and visit to the farmers' house and conduct buying. Farmers who produced smaller quantity (less than four quintals) used to sell on the road side market in the village while higher quantity of turmeric is sold at farm gate to local collectors.

The change in the market place from the Teppi market to farm gate was viewed by farmers as an advantage in that it improved their negotiation position at least to the fixed prices set by the big buyers in the town. The change in selling point has also brought change to the transportation expenditure. There is no cost of transportation to the town market for farmers in *Hibret-fiere* and *Beko* kebeles but farmers in *Addis-Behan* kebele used to transport their produce to the town market about 3 to 5km distance. This was mainly because there are no local collectors or buyers as the case in the other kebeles. Farmers in Hibret-fiere and Beko kebeles were forced to compensate the cost of transport by allowing two kg of turmeric per 100kg for the collectors. Farmers in Addis-berhan, Shosha, and Shuma [8] kebeles were seen paying on average 10-12 birr per 100kg of turmeric to be transported to Teppi town by donkey and horse trailed carts.

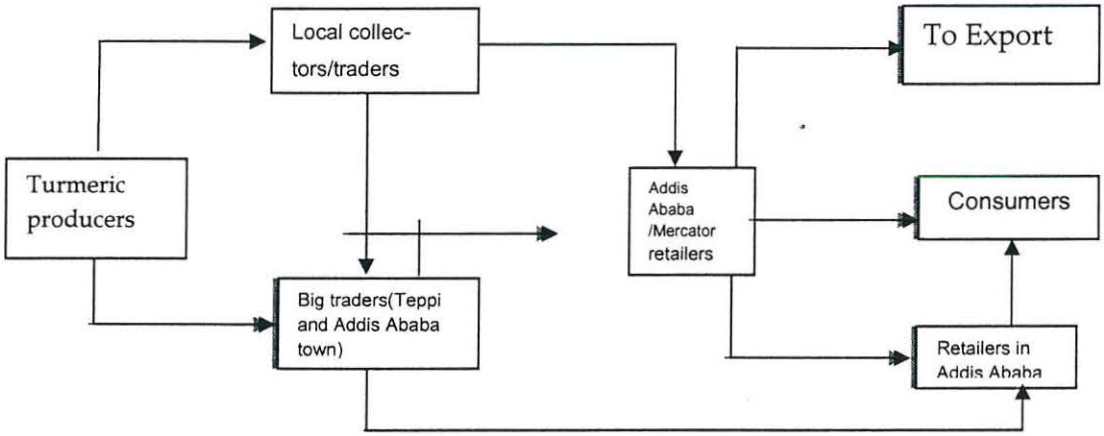
Even though Addis-berhan kebele is more accessible for market,interm of production is considered as low production kebele for turmeric when compared to the other two kebeles. This is mainly because of the limited number of collectors and lack of market outlet. In addition to the limitation to market access farmers in Addis-berhan better alternative to produce food crops easily as they did not face the challenge of wild animals. Hibret-fiere kebele is less accessible by the basic infrastructures but still turmeric is produced more than Addis-berhan kebele. Farmers in Hibret-fiere maintain turmeric production more than Addis-berhan kebele because there is wild animal challenge to produce food crops in Hibret-fiere. So they maintained turmeric even though they are inaccessible to the main road. This has an implication that even though market access in terms of infrastructure determines what to produce for the market but also agro eco-

[8] Shuma and Shosha kebeles were considered for the exploration survey but not in the household survey.

logical setting has played a greater role in determining the decision of what to produce by the farmers.

The number of marketing actors and the channels for turmeric marketing is very limited. The types and levels of buyers in the value chain were summarized in the following diagram(figure 5).

Figure 6 Marketing channels for turmeric in Yeki woreda



(Source: own diagram)

As it can be seen in the diagram above a farmer used to sell to local collectors who again sell to big traders in Teppi town. Another outlet of selling turmeric for farmers is when big traders from Addis Ababa directly come to the area through their agents. This type of sale is very rare but traders coming from Addis Ababa are known by farmers paying better prices and they usually operate for short time and disappear soon. Traders in Teppi town used to create artificial problems against these traders coming from outside by virtue of their monopoly on turmeric marketing. For example I have experienced during my stay in Teppi for this research that a buyer from Addis Ababa was mistreated and hijacked along their car for a night in Hibret-fiere kebele which is believed by most farmers as the 'underground' act of bigger traders from Teppi town.

As indicated in Figure 5 above those local collectors after bulking up the produce used to sell to the bigger traders in Teppi and or to the traders in Addis Ababa. But for these collectors bypassing traders in Teppi is very challenging as these big traders can also influence buyers in Addis Ababa too. Local traders used to sell their stock immediately as price is highly unstable due to the act of monopolists(big trader). The complain of farmers on marketing is not only about low prices given but also the 'underground' cooperation of all traders in the area to pay the same fix prices which is basically dictated by not more than five traders. Farmers from Addis-berhan kebele used to complain much on the sale to the big traders as they still manipulate their prices.

There are many collectors and traders who supply turmeric to Teppi town based big traders. Appearance of many collectors in all the villages of Beko and Hibret-fiere kebeles was the main turning point for the sale of turmeric at farm gate. Farmers were asked to react to the question that says " Do you think that the numbers of collectors in turmeric marketing affected the price of turmeric?", They perceived that the role of collectors in reducing values that goes to them is not significant but the major problem is with big buyers in the chain. So farmers consider that the collectors or middlemen were advantageous in reducing the transaction cost and difficulty of loading and unloading during transportation to the towns.

According to the farmers view the price of turmeric is very low and they propose a fair price for turmeric. They used to say ten birr per kg of turmeric is the fair price which is currently on average 1.8 birr per kg. The problems related to marketing with regard the prices were manly discussed in terms of lack of adequate competitors in the woreda and monopoly of few traders in the marketing channel. When tracing the historical price change compared to the current market prices, it has declined from 30birr per kg early in the 1980s and to 0.25birr per kg

in ten years time. But the experts in Yeki woreda has noted that the problem with turmeric price decline were directly associated with surplus production; existence of few traders in the area; and intervention by the big buyers from Teppi against external buyers coming to the Woreda.

In general the marketing system for turmeric in the study woreda is dominated by big traders and local collectors. The interaction between producer, collectors and traders seem simply but on the ground very strong to exploit the producers. There are no local open market that functions as an alternative outlets for local farmers for turmeric. Instead there is a bulking-up market for intermediary collectors who tend to buy different quality produce predestined for Teppi market or direct export to Addis Ababa. There is at least one village market for other commodities in the locality within a walking distance for the villagers but turmeric marketing is not practiced in those market centers.

In addition, farmers in Noupha/Addis Berhan and *Ebi/Hibret-Fiere* sub-kebele have the option to sell and deliver their products to farmer traders who run local stores. These farmer traders bulk up products just as traders do in formal markets based on their local social network. Roadside retail markets in the study kebeles perform an important function in marketing of food crops and cash crops including turmeric. These markets are a common feature of the village roads and act as an outlet for farmers who want to sell smaller quantity especially by women. These road side markets are very seasonal in relation to peak harvesting time. Roadside retail marketers are in majority of the case licensed collectors for coffee. But they are also the main collectors of turmeric and other food crops.

Wholesalers were based in Teppi town where produces from smaller markets and local collectors accumulated, partially processed, graded and sold to large scale processors and exporters. These are similar to assembly markets and they

are based in Teppi town and some of them have decentralized to *Korcha* village, where turmeric production is intensive. They function as assembly points for lorry loads to be transported to the main urban centers(Teppi and Addis Ababa markets).

These assembly points collect different quality products and they later blend to make a uniform quality that may be directly sold to central market. Since the assembly points which are owned by traders are open every day and farmers usually visit and check for price changes regularly. The majority of the assembly point owners are those collectors in the village who are also residents of that kebele. They still direct some of their produce to the wholesalers based in Teppi town. Most of the assemblers have their own farms and they usually undertake partial processing like coloring and leveling to different grades after they purchase from other farmers .

5.2. Current Marketing Practices of Farmers in Yeki woreda

The survey result indicates that about 80% (n=97) of the respondents have sold turmeric last year while the rest 20%(n=23) did not sale as they have stored for later sale for the better price to come at the end of the season. The majority of sale in the area takes place in January and March. Those farmers who are relatively rich preferred to store until September and October. Poor families used to sell immediately after harvest. Sometimes the wealthier family also sell immediately after harvest for the fear that price will decline and lack of storage facility. But the major reason was to avoid risk of market price fluctuations. As most of the farmers have indicated they used to sale the produce because it occupies large area so they will store outside their home in the veranda. These types of farmers sell frightened by the rain in March and April which affects the quality. Theft is also another social problem that forces immediate sell of turmeric. The majority(78%) of the producers' in the study kebeles have sold turmeric at farm gate.

Few farmers sold to the local road side buyers but insignificant proportion of farmers used to sale to the town market. Some farmers have experienced selling to the wholesalers because of the proximity to the market center. Almost all Farmers in the *Addis-berhan* kebele sell to the Teppi town wholesalers.

According to the investigation results of this study revealed that the proportion of sampled households that sale to local collectors, wholesalers and local exporters was 80.4%, 14.7% and 4.9% respectively. Farmers usually prefer to sale to the local collectors for the reasons that they do not want to incur cost of transportation and cost of loading and unloading. They also fear that price will decline after they take to the market centers. Farmers have good memory of failure in turmeric selling before ten years in which they have dumped their produce in the market. The dumping practice has happened as a result of failure to get buyers, high cost of storage rent in town and inaccessibility and cost of transportation to home back. According to the farmers view selling at farm gate has empowered them and increased their negotiation power. The negotiation power is understood by famers by retaining the already announced price by the big traders from Teppi town.

Selling time has important implication for harnessing better price and reduction of risks for poor families. About 37 % of the farmers have sold turmeric immediately after harvest and 41% have sold after storing for some time while 21% have sold at the end of season. Farmers were asked to evaluate their timing of sell for the last season whether it was it the right time or wrong time. About 51% have evaluated their selling time as the right time and about 35% of them have evaluated as the wrong time. About 14% of the respondents were indifferent to judge the timing as right or not. Those farmers who evaluated their selling time as right indicated that there was price fall after they sold it and they considered it as the right decision.

As it can be observed from table 20 below, only 48% of farmers who sold immediately after harvest has evaluated their timing of sell as right while 72.7% of farmers who sell at the end of the season evaluated their time of sale as right.

Table 15 **Farmers turmeric selling time evaluation**

		How do you evaluate last season selling time?		
		Right(n)	Not right(n)	I do not know(n)
Time of sale	Immediately after harvest	48.6%(18)	45.9%(17)	5.4%(2)
	sometime after harvest	47.6%(20)	42.9%(18)	9.5%(4)
	At the end of the season	72.7%(16)	9.1%(2)	18.2%(4)

Source: Own survey, March 2009 * n in parenthesis indicates number of respondents

Those farmers who sold after storing turmeric were classified into two categories based on the time they store before sale. Accordingly 54.7% have stored for three months and less whereas 45.3% of the respondents have stored for more than three months after harvest. When their evaluation for timing is associated to numbers of months they store, only 37.8% of farmers who sold after storing for less than three months have evaluated their time of sale as right. This indicates that farmers did not get what they call fair price for their storing efforts. On the other hand about 70.8% of farmers who sold after storing for more than three months have evaluated their time of sell as right with less than 5% of them indifferent. This has the implication that turmeric price at the start of the season increases and decline in between and again rises. Price variation is unpredictable and have no pattern. It reaches maximum in certain months and go down to minimum in the next month(see for more detail table in appendix 4).

Most of the farmers who have been stricken by the unstable market price have discontinued turmeric farming. The majority of the current discontinuations of

turmeric production have a profound base on market failure. Older farmers have a bad memory of turmeric selling at Teppi market at least once in their course of adopting turmeric.

To investigate the impact of their experience of market failure to turmeric disadoption, farmers were asked to remember recent failures. About 63% of the respondents have experienced market failure especially when they were selling to Teppi market. Farmers used to say they have market failure when they lack buyers and when very low prices are given to the produce compared to the price information dispatched before they took the produce to the market which is unable to cover transportation and storage costs. Farmers have responded differently to failure in turmeric marketing. Among the respondents 12.7% of them have indicated that they have taken home back; 19% of them stored in someone home and paid rent; 36.7% have sold at whatever lower price offered by the traders; and 31.6% of the respondents have indicated that they have dumped in the market which is the worst case. The extreme cases for those farmers who dumped in the market have also in turn abandoned their turmeric fields. It is very clear from the observation of this information that market has played an important role in discontinuation of turmeric production in Yeki Woreda .

Considering the current season price of turmeric, farmers were asked to evaluate the price in relation to the previous year and other crops sold in the market. Only 19% of the respondents have reported it as better price but the majority(59%) have evaluated as poor. Farmers have evaluated the current price of turmeric as poor because the price of the other crops has increased considerably but the current price of turmeric is the same as the price it fetches five years ago.

In terms of their negotiation power on prices, farmers were seen price takers which are set by the monopolistic buyers in Teppi town. About 76% of the re-

spondents have indicated that they do not negotiate price but they sell by the price offered by the local collectors. The other factors that demotivated the farmers were undifferentiated price for different quality produce. About 82% of farmers have indicated that buyers do not pay differential prices for better quality turmeric rather they use few farmers quality product to blend and mask the general quality deterioration of turmeric by the majority of the farmers.

5.3. Major Marketing Constraints in Turmeric Production

Farmers were requested to rank a list of marketing problems on scale of 1 to 4 based on their own perception and experience of marketing challenges. A cut points for the categories of marketing problems were set based on the mean score of each variable. The problems were categorized as 'severe', 'moderate', 'minor' and 'not a problem' to turmeric marketing. The empirical result of the survey shown in table 16 indicates that unstable price, low price given, lack of price/market information and monopoly by few traders were found the severe problems among the lists. Table 16 shows that defect/loss during marketing, access to credit and inaccurate weight were rate as minor problems. These were said minor for the reason that farmers seldom transport the produce and no additional transactional cost incurred as the majority of them sell at the farm gate. Farmers did not recognized as major problems associated with weight inaccuracy because of the bulky nature of the product and farmers have accepted as the rule of the game that 2kg per 100kg allowance for the buyer for loss and transportation costs. Problems in rated as severe are the most important ones to determine turmeric cultivation and the ones need attention for intervention. In the same way those problems in the category of minor may emerge as severe if measure are not taken in advance.

Table 16 **Farmers rating of marketing problems by sample households**

Marketing problems	Mean	SD	Farmers Level of rating the problem*
Low price	3.9	.26	Severe
Unstable price	3.6	.55	Severe
Inadequate transportation	2.2	.91	Moderate
High rate of defect	2.7	.82	Moderate
Inadequate marketing information	3.7	.52	Severe
Lack of grades	3.4	.70	Moderate
Existence of many collectors(middlemen)	2.8	.98	Moderate
Low credit access	1.9	.91	Minor
Inaccurate weight	2.1	.84	Minor
Anticompetitive and monopolistic nature of traders	3.6	.71	Severe
Low demand of turmeric in the market	2.8	.78	Moderate

Scale*: [1-1.5)= not a problem, [1.5-2.5)= minor, [2.5-3.5)= moderate, [3.5-4.0) =severe;

Source :own survey, March 2009

There is no known grade for turmeric product as for coffee except that traders use simple and nonstandard physical detection methods for extreme quality distortions. Traders also give grade for the quality of the products as per the area of production(e.g. turmeric from *'Metti'* area have higher acceptability and higher price at Teppi). As it can be seen from the analysis in table 16, all problems listed have impacted and constrained turmeric production in Yeki woreda even though their degree varies.

5.4. Role of Marketing Information in Turmeric Production

5.4.1. Marketing Information Sources and Farmers Information Need

The most important source of marketing information for the farmers in Yeki woreda were indicated as traders for 35% of the respondents; extension workers acting as 'marketing agents' for 29.0%; cooperatives for 21.7% and neighboring farmers for 14.2% of the sample households. Majority of the local traders operating at the local level perform the role of disseminating information with regard to the prices and quality needed by the big buyers in Teppi town. These traders have updated information about the upper limit(ceiling) price set by the big buyers so that they have rooms to manipulate prices to maximize their margin of benefits. These traders act as sole sources of information at local level even for the extension workers and cooperatives in some of the cases. At present extension agents and cooperative staffs serve as 'marketing agents' for the farmers in absence of such services in all the villages surveyed. Absence of targeted and effective public marketing information system on spices at local level has impacted the production and marketing system. Price information collection on monthly basis in the study area by the central statistical authority(CSA) gave marginal attention and seldom appears on their list and is not communicated to the local level users. There is marketing service departments at woreda level to support the marketing of agricultural products. But it seem their role is limited to collecting information about the commodity movements but not information dissemination to the local level users(farmers. Farmers are willing to have such marketing information agencies which can provide them reliable information about marketing situations so that they can stay in the business of turmeric and other spice production and marketing.

The available sources of marketing information for farmers discussed above have

concentrated on the provision of their specific type of information. Most of the communicated information were about prices and quality of turmeric needed by the buyers in the market. Traders have dominated the information processing and dissemination function through their representatives in all potential turmeric production sites.

Traders have realized that most of the farmers start harvesting after having information about the prevailing marketing situations. In most of the cases farmers argue that traders deliberately deliver wrong information about the first prices for the new production season as mechanism to motivate farmers to start harvest turmeric. Information delivery system during the early stage of turmeric harvesting is in favor of the information sources(the traders). When farmers are seen motivated to harvest and process turmeric, traders start to decrease the price. It is clear that the first price is not the real price that traders are willing to pay for the farmers. It is rather used as mechanisms to motivate farmers to produce in large quantity because farmers are becoming reluctant to harvest turmeric. Usually the price of turmeric at the end of the season rises up to 3.5birr/kg and drops for the new harvest season below two birr per kg. Most farmers used to harvest turmeric early targeting the previous season price but they usually fail to capture it because of the manipulation of the traders. In this way it is very clear that traders not only control the marketing aspect but also the production aspects of turmeric in the area through their pricing mechanisms mainly by manipulating marketing information.

As it has been discussed earlier in this section farmers have different sources of information but what is the major and commonly communicated messages by each of the distinct sources? All of the marketing information sources were seen communicating prices as an important information type to the users. The survey indicated that 61.7% of farmers have responded that the major information type

widely communicated is about prices and 14.2% of the respondents have said quality demanded in the market as an important component of the information. From the total sample respondents only 11.2% have indicated the inclusion of information about varieties to be produced. The marketing information sources discussed above have their own major information type that they specialize on it. As indicated on table 17, traders have the upper hand in providing the price with least concern for the other components of information. Extension agents, as one of marketing information sources, focus on information related to turmeric quality.

Under smooth functioning marketing situations the existence of different sources of information ensures information availability for the users. It is evident in table 17 below an association was made between marketing information sources identified in the locality and information types they deliver as their major components for the farmers.

Table 17 Relation between sources and types of information provided

Information sources	Type of information provided by the sources			
	Prices(%)	Improved varieties(%)	Improved practices(%)	Quality Demanded(%)
Traders	85.7(36)	0(0.0)	0(0)	14.3(6)
Primary Cooperative	65.4(17)	7.7(2)	13.8(1)	23.1(6)
Extension workers	22.9(8)	28.6(10)	34.3(12)	14.3(5)
Neighbors farmers	76.5(13)	11.8(2)	11.8(2)	0(.0)
Total	61.7(74)	11.7(14)	12.5(15)	14.2(17)

Source: own survey, March 2009 *number in parenthesis indicate the percentages*

Beside the availability and variability of information on spice marketing, farmers have strong affiliation to the reliability of information provided by different sources. Farmers attach trust to a certain sources and accordingly they have their

own preconceived reliable sources which they can rely on it.

There was also strong relationship between farmers' information need and what they call reliable information sources. Despite the importance of traders to supply marketing information in the area, they are the least preferred by the farmers as reliable information sources. In general farmers have tendency to prefer information to be supplied by a known organizations like government and government representatives. They have selected extension workers as the most preferred and most reliable followed by local collectors. Cooperatives and town based traders are the least preferred source in terms of reliability. The case with cooperatives was indicated poor in response to their incompetency to provide adequate information from the previous experience. Farmers in Hibret-Fiere Kebele have justified that their cooperative has failed at the start when it started intervention of turmeric market. They collected turmeric from members to sale to the central market(Addis Ababa) but fail even to return back the empty bags of turmeric.

It can be concluded from the discussions so far that the economic and social cost of misinformation in the case of spices particularly in turmeric is daunting. Most of the producers reporting the experience of failure in selling turmeric have associated to the marketing misinformation impact. According to farmers misinformation is the deliberate act of the big traders in town during that time. The bad times in turmeric marketing was all associated to the misinformation. The decision of farmers during such situations was to sale at reduced cost of what the buyers want. This is because the cost of transporting to home is greater than the price given per unit. In the most terrible cases where buyers are absent or did not want to buy turmeric was dumping in the market so that town dweller in Teppi town used it as a fuel. As a consequence of that event most farmers have interrupted producing turmeric the next three years until price stabilizes and farmers

develop confidence in it. This was how marketing information determined the disadoption of turmeric technologies and how market is important in the subsistence agriculture towards the move to commercialization of their farms.

Another investigation was towards farmers marketing information need. The discussions made so far shows that most of the sources used to deliver information regarding primarily the prices and the quality of turmeric. It is indicated by most of the farmers that the sources did not consider their information need. To complement what is true in reality, an assessment on farmers marketing information need was conducted. As indicated in table 18 below about 49.2% of the sample of respondents have indicated that they need information on prices of turmeric at different market places as the first priority information while 12.5% have indicated their need as market place to sell and about 5% have shown that they want to know appropriate time/season of selling and quantity demanded in that particular markets. But a significant proportion(28%) of farmers have indicated as first priority to know is the quality needed in the market so that they want to produce smaller quantity of turmeric meeting standard quality. This is an opportunity to improve the quality of turmeric by enhancing information delivery based on the farmers need that empowers them to compete.

Table 18 Marketing information need of farmers

	Information type	Proportion of Households % (n)
1	Price at different locations	49.2(59)
2	Market place to sell	12.5(15)
3	Time/season of sale	5.0(6)
4	Quantity demanded in the market	5.0(6)
5	Quality needed by the buyers	28.3(34)

Source: Own survey, March 2009

The implication of farmers diverse and variability of information type and need

in relation to market place and quality needed has its own implication to improve the sector. Farmers wanted to know alternative outlets for turmeric and they want also to participate in taking their produce to the alternative markets available elsewhere. It would be a sound argument to claim that farmers have their own specific type of information need and all strategies of delivering information in that regard has to base itself on the need of farmers.

5.4.2.Farmers Method preference for Marketing information acquisition

Provision of sensitive information like marketing prices need strong caution with reliable and traceable back up supports from institutions in a complementary way. These types of information can cause higher loss in favor of the source. Farmers have higher suspicion to receive price related information from unknown and unreliable sources. The survey result indicated in table 19, shows that farmers prefer to receive marketing information(especially price) via regular radio price announcements by 63.3% of the respondents followed by cooperative staffs by 25% of the respondents as their first preference. The third method preferred by fewer respondents was their own assessment in the market places with its many limitations. Newspapers and telephone were ranked last as alternative methods to receive reliable marketing information in the area. The use of telephone especially mobile phone was viewed as constraint in turmeric marketing by farmers as the major users of these mobiles are the traders themselves. Farmers associated the enhanced traders' communication capacity as negative contributor to their advantage for it reduced the opportunity to get alternative buyer. As a result most of the farmers did not selected telephone and newspapers as a viable information exchange methods and even they do not want to rank them.

Table 19 **Farmers preference for methods of market information acquisition**

Kebele	Methods preferred					Total
	Radio % (n)	cooperative officers % (n)	Newspaper % (n)	Telephone % (n)	own assessment in the market %(n)	
Hibret-Fiere	55.0(22)	30.0 (12)	0 (0)	.0 (0)	15.0(6)	100.0(40)
Beko	73.2(30)	19.5 (8)	.0 (0)	2.4 (1)	4.9(2)	100.0(41)
Addis Birhan	61.5(24)	25.6(10)	7.7(3)	.0(0)	5.1(2)	100.0(39)
Total	63.3(76)	25.0(30)	2.5(3)	.8(1)	8.3(10)	100.0(120)

Source: Own survey, March 2009

Farmers' method preferences to receive marketing information have shown a slight variation across the study locations. Radio is the most preferred method in all kebeles but there is variation among the selected kebeles on the second and third methods preferred. Hibret-fiere Kebele farmers have more inclination to cooperative than the other two kebeles because of the existence of active primary cooperative in their kebele. This cooperative has history in marketing of turmeric but it soon withdrawn from the business as a loser. Farmers in that kebele wanted to rely on the cooperative as source of reliable information and trusted method. The absence of cooperative in *Beko* kebele forced them to rely heavily on radio and cooperative to a lesser extent.

The discussions made so far has enlightened that it was not only the reliability of the sources that determine marketing information service delivery success but also the method received through it. In discussion of providing reliable marketing information it was also important to know the acceptability of the sources and the method used to disseminate marketing information.

Chapter six

6. Conclusions and Recommendations

6.1. Conclusions

Turmeric production in Yeki accounts an important income source for smallholder farmers. It contributed a significant share to the income of producers' income in the community. The most important resources farmers committed for turmeric production were land and labor. In the current production system these resources are becoming the major limiting factors of turmeric production in the area. Households use their available land and labor to cultivate primarily coffee and turmeric entirely for sale and the remainder land to cultivate food crops. The sum of land allocated for coffee and turmeric production occupied the major part of their farm followed by maize and sorghum indicates that their farm is commercialized. Households allocate about a quarter of hectare for turmeric production.

There is a decreasing trend of turmeric land allocation and volume of production in response to the unstable and low prices given to farmers. Labor and fuel wood demand constrained turmeric processing in the area. It was found out that the cash need of the farmers was not also fulfilled because of the low prices given to turmeric produced by the farmers. In case of very low price farmers postpone harvesting of turmeric for the next year which has impact on the quality of the produce. Discontinuity and disadoption is the feature of turmeric production in the study area for the last ten years that have profound impact on their livelihood sustainability. The extension services given on turmeric was found very weak and inadequate and not sufficiently targeted to improve the productivity and quality. Farmer to farmer turmeric technology transfer was the major and strongest and dependable for the majority of the farmers since its introduction.

Even though the productivity potential recorded at the research stations were found comparable to the world standard(250qt/ha), the productivity of turmeric at household level was very low which implies their technical efficiency is low and need to be utilized. The recommended varieties and accompanied cultural practices were not in use as per the recommendation of the research output. Farmers are producing turmeric based on their experience developed for over years. Farmers plant turmeric as sole and there are no integrated and complete package of technologies adapted and disseminated so far even though farmers were interested on such improved technologies to improve their land use efficiencies which is the major limiting factor in the area.

Marketing of turmeric faced tremendous challenges over years and in recent years as well because of the anticompetitive nature of turmeric marketing practices along all channels. Few traders have dominated the collection and delivery of turmeric to central retail markets. The majority of farmers have faced interruption/discontinuity of turmeric production because of low market prices. For the last three years(2005-2008) turmeric faced the highest discontinuity rate not only because of the low price but also another emerging factor, the drastic increase in the price of food crops. The implication is that there is a need to address both food and cash crops together to promote sustainable production of both to support livelihood of the producers in cases where market did not function smoothely.

In majority of the cases farmers were forced to sell their produce at farm gate without value addition. Most of the farmers used to sale immediately after harvest because of the marketing risks that price will decline. Turmeric producer farmers were seen as price takers and have low negotiation power .

In response to the low incentive provided for the quality product, farmers were very reluctant in producing quality products. The traditional labor intensive

processing techniques were replaced by artificial coloring of the outer part of turmeric rhizomes which has direct impact on the marketability of the produce to both the domestic and export markets.

Farmers face problem of accessing reliable marketing information in terms of the type they need , trusted sources and preferred method of receiving it. There is no formal and structured marketing information dissemination for farmers in the area. Famers depend on traders for most of the information related to marketing of turmeric which makes them vulnerable to unstable prices that they lost confidence on projecting what will be their production decisions. Availability and access for marketing information has influenced the way turmeric is produced, processed and traded by farmers. The new trading system with numerous middlemen has also contributed in lowering the price that goes to the farmers in the chain even though farmers did not complain their existence as a challenge. Farmers wanted to receive market information, to enable them to monitor market changes and to apply this information to a range of marketing decisions. These marketing decisions were envisaged as making decisions on selection of marketing locations, when to sell in the season, making improvements on quality, storage, and for improving their negotiation capacity to gain better price. These types of information were soughed from a trusted source of which they have already familiarity with. In addition to the type and reliable source farmers has shown preferences for certain types of methods to receive marketing information. Radio and cooperatives were the most preferred methods. So it would be very wise to consider the preferred methods besides the content of the message for those particular users when designing marketing information services in the area.

The general shift and inclination of farmers from purely cash crop to food crop production was basically influenced by the prevalence of unfavorable marketing

practices. Based on the result of this study it was possible to conclude that turmeric has lost its comparative advantage because of the unreliable marketing practices. The shift to other food crops to minimize marketing shocks on their livelihood may impose cost for the farmers in terms of fertilizer and seed for maize and sorghum which they did not use before. The shift has also impact on the volume of turmeric export and thereby reduce country's income as well.

6.2. Recommendations

- In order to stimulate sufficient and sustainable production of turmeric as cash crop, agro processing industries should be expanded in rural areas so that farmers do not rely on sale for limited market demand. Such arrangements would induce farmers to produce competitive and high quality turmeric and it will ensure a stable demand for the farmers produce.
- Farmers must be provided with improved technologies of food crops and cash crops as well as concern to improve their productivity. In the view of increasing the contribution of turmeric to export volume equal attention should be given to food crop production as farmers face raise in food price and decline in their cash crop prices.
- Proper institutional linkage and arrangements should be strengthened to enhance cooperation between primary cooperatives, research centers, marketing services, traders and exporters of turmeric.
- Adequate and targeted trainings should be arranged for farmers that can enhance their efficiency. Alternative technologies in terms of varieties, processing techniques, improved and simple as well as affordable implements should be provided.
- Market should be based on the competitive and open to all legal traders so that farmers can diversify their market outlets.
- Marketing information services should be rendered to turmeric producers as an important input to empower farmers' negotiation position. In addi-

tion it should be noted that marketing information delivery efforts should consider the farmers need and preference of methods to receive the needed information.

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8. Appendices

Appendix 1 Export of selected spices of Ethiopia('000 birr)

Year	Red pepper	Ginger	Black Cumin	Turmeric
2003	16,636	14,109	5,728	**3,700**
2004	9,318	32,876	7,746	**9,390**
2005	19,442	52,570	2,540	**3,500**
2006	8,720	36,149	7,020	**1,751**
2007	21,497	56,028	30,147	**3,523**
2008	2,844	34,512	14,178	**2,024***

Source: Engineering capacity building project private sector development (ECBP) 'Dry ginger export in SNNPR, 2008

Appendix 2 . Annual report of turmeric channeled to central market from Teppi Market

Year	Turmeric(qt)	Ginger
2001	4400	2700
2002	4500	1500
2003	1044	605.15
2004	12969.4	1069.55
2005	12614.3	691
2006	1571	2180
2007	2553	3975
2008	658	518

source: Annual report of Marketing department of Yeki Woreda Agri. And development office(2009)

Appendix 3 Major crops Trend in Shaka zone(qt)

Year	maize	sorghum	coffee
2003/2004	1590	4920	5186
2004/2005	1475	4835	5612
2005/2006	1870	5313	6512
2006/2007	2147	6363	5975
2007/2008	1460	7355	9460

Source: CSA bulletins (2003-2008)

Appendix 4. Turmeric price over months across the year(1997-2008)

	Turmeric Price across months(birr/kg)											
	Sept	Oct	Nov	Dec	Jan	Feb	Mar	April	May	June	July	Aug
97	49.81	52.72	48.45	50.12	49.02	49.23	47.47	**55.08**	48.97	48.07	**45.59**	51.36
98	44.85	45.87	47.32	48.59	47.64	45.77	45.8	**50.28**	45.44	45.5	**41.83**	42.93
99	**1.78**	-	-	-	3.00	2.46	3.00	2.53	3.00	4.63	5.53	**5.72**
00		-	-	**5.00**	-	-	1.26	4.02	**0.75**	1.93	-	-
01	-	-	-	-	-	-	-	-	-	-	-	-
2	0.71	0.48	**0.36**	0.48	0.59	0.49	0.55	0.86	**2.85**	-	-	-
03	0.71	0.48	**0.36**	0.45	0.59	0.49	0.55	0.86	**2.85**	-	-	-
04	**10.00**	-	**1.21**	3.89	2.96	3.49	1.67	3.78	1.54	-	4.02	-
05	0.77	0.71	0.65	0.59	0.68	1.16	**3.09**	0.98	1.53	1.26	**0.50**	-
06	-	**1.11**	-	-	-	2.00	2.17	2.02	1.31	-	1.67	**2.20**
07	2.70	2.60	3.60	3.20	**4.40**	**0.50**	1.51	-	-	-	-	2.50
08	**0.72**	1.75	1.16	**3.63**	0.77	0.98	2.30	1.81	1.54	2.00	-	-

Source: CSA data base for producers price(1997-2008), the prices used is the national average price

ppendix 5. Guidelines for FGD

Focus Group Discussion questions on turmeric production and marketing

1. Since when is turmeric produced in your village? Has the way it is produced the same or changed? If yes, what were the changes and reasons for changes?
2. Who works on the turmeric field? Family worker only, male only , female only or hired labor(from where and how much to pay? Is there special tasks that women only do? If that is the case what is that? Is there special tasks for children? If so what is that?

3. Is there any change in the way turmeric is traded , If turmeric trade has changed since the last 5-10 years , what are the changes? Has it improved or worsened to you? What are the causes and problems with the new trading arrangements?
4. Do you think you get a fair price for your turmeric? If no, what would be a fair price per kg of turmeric?
5. Did the amount of income you get from turmeric changed since ten years? If it decreased what were the substitutions?

Appendix 6 : Questionnaire

Addis Ababa university
School of graduate studies
College of Development Studies

Introduction

This questionnaire is designed to assess the practice and constraints on turmeric production and marketing by smallholder farmers in Yeki woreda of Sheka zone/SNNPR, which will help to design future improvement strategies and set research priorities to enhance the production and marketing of spices in the surveyed area. The analyzed result of this research will be used to compile report for the fulfillment of Mr. Derese's MA degree in development studies in Addis Ababa University.

Part I

1. Profile of the respondent

a. Name of the respondents----------

b. Sex of the respondent: 1= male, 2=female

c. Age :---------

d. Level of Education of the household head: Illiterate------
Read and write-----
Formal schooling

e. Religion: Christian----Muslim-----catholic-----other---------

f. Address: Kebele-----Qetena---------

g. Distance to all weather road----------

h. Distance to FTC / DA center----------

i. How long have you been in farming?_____

j. How long have you been farming on spices?_____

2. **Household labor**

Age group	Number		Remark
	Male	Female	
<15 years			
15- 60 years			
>60years			

Part II

1. Major source of income to household

1. Last season, what is your Farm Income from different enterprises and relative importance

Enterprise	Income(birr)	Rank
Coffee		
Cereal(maize, sorghum, etc		
Enset		
Livestock		
Vegetables and fruits		
Honey		
Turmeric		

2. Do you have non-farm income source? 1=yes, 2 =no

3. If yes , what is that?

1. Hand craft 2. Wage labor 3. Trading of crop or livestock products

4. Any other----------

2. **Resource endowments**: What type and no of assets owned by the respondent?

Table 3. Livestock and market value·

s/n	Type of livestock	number	If you want to buy similar livestock how does it cost in local market?
1	Oxen		
2	Cow		
3	Heifer		
4	Calf		
5	Sheep		
6	Goat		
7	Equines		
8	Chicken		

Table 4 Household amenities

s/n	Name of consumer durable	Number	If you want to buy similar consumer durable how does it cost in local market
1	House made of corrugated sheet of iron		
2	Additional house in town		
3	Traditional hut		
4	Chairs		
5	Tables		
6	Bed		
7	Cupboard		
8	Watch		
9	Radio		
10	Tape player		
11	Telephone(landline or wireless)or cell phone		

3. Land and related information

1. Do you or member of you family have land? 1=Yes, 2= no

2.How many different plots do you have? ----------(write number)

3.Total land owned by the family (local unit)----------

4.During last agricultural season, how many hectares of land cultivated?

Own land----------, rent ----------. Sharecropping----------

4. Grown crops and input use

Table 6 . Food crop production status(last season)

Crops produced last season	Total produced	Consumed at home	Stored in stock now	Sold		Bought from the market	
				Quantity	Value(Birr)	Quantity	price(per kg)
Maize							
Enset							
Taro							
Sorghum							

Part III

5.Turmeric production status

1.When do you start producing turmeric?----------(year)

2. For how many seasons have you been producing turmeric?------

3. Have you interrupted growing turmeric? 1=yes, 2= no

4. If yes, what was your reasons?

1)lack of planting materials 2) lack attractive market

3)lack of knowledge 4) other----------

Table 5 Currently produced crops

Name of crops grown last year(2000 EC)	Land allocated(ha)	Have you applied fertilizer? 1=yes,2=no	If yes, which fertilizer and how much?	Perceived soil fertility status 1=highly degraded, 2=degraded, 3=slightly fertile, 4=fertile, 5=very fertile
Maize				
Enset				
Taro				
Sorghum				
Coffee				
Spices				

5.How is the trend of land allocation for turmeric production in your farm?

1.increasin2. Decreasing3. Constant 4. Inconsistent

6.If increasing, how do you get additional land?

1. Decreasing maize land2. Decreasing land of coffee

3. Using fallow land4. By Clearing additional forest land

5. Renting land from others

7. If decreasing, what is your reasons?

1. income from turmeric is decreasing 2. productivity decreased

3. shifted to food crop production 4. lack of market for turmeric

8. How are you producing turmeric in your farm?

1. As major crop(planned cultivation like other crops)

2. As minor crop(just as filler, on the land remaining after other crops)

9. How are you cultivating turmeric?

1. Sole 2. Intercropped 3. In rotation with other crops

10. What motivates you to start producing turmeric?

1. Training on how to produce

2. Advice and experience of neighbors'/friends producing spice

3. Observation of its importance from market

4. Field days

5. Advice by extension workers

6. Advice by researchers

11.What conducive factors are there to produce turmeric in your area?

1. The weather2. Soil 3. availability of labor 4. land availability

5. Availability of inputs6. Availability of encouraging/attractive market

12. Where do you get planting material/seed?

1.Research center 2.from other farmers

3. Own stock 4. from market

5. Agricultural offices 6. Other-------

13. Is there a continuous supply of turmeric planting material/seed for purchase? 1=yes, 2= no

14. What is your future plan of turmeric production?

1. To increase 2. To decrease 3. To remain constant

15. Are you still producing turmeric? 1=yes , 2= no

16. Which of the following spices are grown on your farm?

Table 7 farmers estimate of the total land area allocated and total yield obtained from each spice crops in 1991, 1996, and 2000 E.C.

Major Spices (first list the major spices grown on farm)	Ginger		Turmeric		Korerima		Black pepper	
	Area	Yield	area	yield	Area	Yield	area	yield
Year 1991(10 years back)								
Rank in their order of importance								
Year 1996(five year back)								
Rank in their order of importance								
Year 2000								
Rank in their order of importance								

6. Proportion of cash crops produced in last year (2000 /2001 E.C) and used for various purposes

Table 8 cash crop production and proportion for different uses

Crops produced last cropping season	Total produced(local unit)	Consumed at home(local unit)	Stored in stock (house) now(local unit)	Sold	
				Quantity	Value in birr
Coffee					
Spices					
Fruits					
Honey					

7.Do you have oxen? 1=yes,2=no

w many?----------

you use irrigation for the turmeric production? 1=yes, 2=no

id you get credit for turmeric production activities?1=yes,2=no

yes, how much?----------

ource of credit/loan

1.Cooperatives 3. Credit and saving associations

2.NGOs 4. Private lenders5. Other----------

Turmeric production costs and income

Table 9 cost and returns of turmeric

Items	1998 E.C	1999 E.C	2000 E.C
ı land(ha)			
: for land(birr)			
l/planting materials purchase(birr)			
ilizer cost(birr)			
ed labor cost(birr)			
oring cost(birr)			
wood cost(birr)			
nsport cost(birr)			
r costs related to production(birr)			
Total cost(birr)			
of turmeric (qt)			
of turmeric(birr/kg)			
Total income(birr)			

Spice Extension services and related aspects

1. Did you received training on turmeric production and processing? 1=yes, 2= no
2. Did you attended demonstration on turmeric technologies(varieties)? 1=yes, 2= no
3. Did extension workers visited your farm and contacted you for spice related issues? 1=yes, 2= no
4. In one year how many times extension workers visited you?----------

5. Do you visited Teppi agricultural research Center in your locality? 1=yes, 2= no

6. If yes, what is being done there?----------

7. Do you think that the extension services you received on turmeric is adequate? 1=yes, 2= no

8. What type of services do you need in turmeric production? Table 10 extension services

s/n	Support type	Tick as many as applicable(✓)
1	Seedling/planting material preparation	
2	Weed control method	
3	Disease management	
4	Fertilizer application	
5	Field management after plantation	
6	Post harvest treatments and storage	
7	Information how to dry the produces	
8	Information how to intercrop with other crops	
9	Soil fertility management	

IV

Turmeric marketing

1. Did you produce turmeric in excess of home consumption? 1=yes, 2=no

2. Did you sell turmeric last year? 1=yes, 2=no

3. Where do you sell?

1. At farm gate2.Local market3. Town 4.other_____

4. When do you sell the product?

1.Immediately after harvest2. Sometime after harvest(specify)---

3. End of the season 4. other_____

5. To whom do you sell?

1. Consumer2. Local collectors3. Wholesalers4. Cooperatives

5.local Exporters6. Others_____

6.Whom do you prefer to sell to and why?_____

7.In your opinion, How do you evaluate your turmeric selling time?

1.Right time2. not right time3. I do not know

8.Have you ever failed to sell the turmeric you produced? 1=yes, 2=no

9.If yes, What do you do in that cases?

1.Take home back 3. Stored in some ones home at market place

2.Sold it at low price 4. Left it in the market(dumped) 5. Other------

10.How is the market demand and price of turmeric, as compared to other crops?

1.Better2. Poor 3. Similar4. It fluctuates

11.Can you negotiate price? 1=Yes, 2= no

12.Do buyers pay different price for different quality of turmeric? 1=yes, 2=no

13. Do you color your turmeric before you take to market/sale? 1=yes, 2=no

14.If no, why?

1. No skill/knowledge 2. No facility to process

3. The price does not vary significantly 4. Coloring demands more labor

15. What is the means of transportation to the market?

1. vehicle2. Animals3. Human 4. Other----------

16. How much do you cost to transport the produce to the market?---------

17. What is the distance to the nearest market center?----------

18. What is the distance to the biggest and town market place?----------

19. Where do you usually prefer to sale your produce?

1= nearest local market place 2= biggest or town market place

20. Turmeric Marketing problems

Table 10 rating marketing constraints

Type of problems	Severity of the problems

	No problem(1)	Minor(2)	Moderate(3)	Very severe(4)
Low prices				
Unstable prices				
Inadequate transport				
High rate of defect				
Inadequate/ no price information				
Lack of standards and grading				
Too many local brokers or dealers				
Limited access to credit				
Inaccurate weight				
Anti-competitive practices(e.g. monopoly by few)				
Low demand for turmeric				

TECHNOLOGICAL AND MARKETING INFORMATION SOURCES

1.Which method of information dissemination is more relevant to you in getting awareness about spice production packages and improved practices?

1.Experts 3. leaflets and manuals 4. Radio

15.Field days and demonstrations 6. TV 7. Other---------

2.Which of the sources are reliable to you about spice marketing?, why?

1.Traders 2. Cooperatives 3. Extension workers

4.Farmers/neighbors Reasons----------

3.What type of information you get from the selected sources for marketing?

1.About prices

2.About improved varieties

3.Improved practices

4.About quality demanded in the market

4.Which of the following is most important information need with regard to marketing?

1. Prices at different locations3. Market Place to sell 4.Time of sale

5.Quantity demanded in the market 6. Quality needed

5.Who will provide you such information easily?

1.Traders2. Cooperatives/unions3. NGOs3.Extension workers 4. Local Collectors

22.How do you prefer to receive the information you need in marketing(price) and rank according to reliability

	Rank
1.Regular Radio price announcement	----------
2.Cooperatives officers	----------
3.Newspaper	----------
4.Telephone	----------
5.Market places	----------

V

TURMERIC TECHNOLOGIES AND RELATED ASPECTS

How many turmeric varieties do you know? name them

1.---------- 2. ---------- 3. ---------- 4. ----------

!.How many of them you used in your production?----------

Which varieties do you prefer?----------

a.Why?----------

Household food security assessment and perception

1.The staple food you produced and income you get from other sources, is that sufficient for your family last year? 1=yes, 2=no

2.In order to meet the subsistence needs of your household, how much would you need for one year. Food (in kg)---------- and Cash(in birr)----------

3.In which months was food shortage serious for your household?----------

----------,----------,----

4.Date of interview----------

5.Name of the interviewer----------

Thank you for your cooperation!

Declaration

This is my original work and has not been presented for a degree in any other university. All source materials used for the thesis have been duly acknowledge.

Name: Derese Teshome Mekonnen

Signature:- ----------

Date: 15 July 2009

This thesis work has been done under my supervision as university advisor and approved by the examining board.

Workneh Negatu(PhD) ---------- 16 July 2009

Advisor Signature Date