Opportunities and constraints of coffee production in West Hararghe, Ethiopia

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Assessing factors influencing coffee production and productivity was used to develop appropriate technology for improvement and inform policy makers to understand gap concerning the commodity. Therefore, this study was designed to assess constraints and opportunities of coffee production in West Hararghe Zone. It employed multi-stage sampling procedure. In the first stage, Daro Lebu, Habro and Boke districts were selected purposively based on coffee production potential from the zone. In the second stage, a total of seven kebeles and 170 households were randomly selected. Household questionnaires were employed to collect primary data and analyzed by using descriptive statistics. The study revealed diseases, pest, poor access to market information, lack of physical infrastructure, lack of improved coffee variety and weak extensions services were major constraints of coffee production and productivity. On the other hand, high quality of Harar coffee, high demand of Hararghe coffee on world market, construction of rural road, availability of mobile phone, good indigenous knowledge were major opportunities for coffee producers in the area. Therefore, findings of study indicated that development of disease resistance coffee variety, assessment of farmers’ indigenous knowledge, providing extension service and enhancing infrastructural and institution facilities need emphasis to improve coffee production and productivity.

Key words: Coffee landrace, farmers’ indigenous knowledge, coffee disease, market access.

INTRODUCTION

Coffee is the world’s most widely traded tropical product, produced in over 50 developing countries. Even though many species of coffee exist, for commercial production, Coffea arabica and Coffea canephora took the principal share and more than 60% of global coffee production is based on C. Arabica (CAB International, 2006). Coffee makes an important contribution to socio-economic development and poverty alleviation and it has exceptional importance to exporting countries, some of which rely on coffee for over half of their export earnings. About 25 million smallholder farmers and their families produce 80% of world coffee production, that is an important source of cash income and responsible for significant employment (ICO, 2010).

In Africa Coffee is grown in many sub-Saharan countries and mainly by small-holder farmers. Coffee producing countries in Africa, especially those producing C.Arabicas, stand to earn export revenue windfalls as a result of the recent increase in the commodity’s price on the international market. However, physical limitations in some coffee growing countries in Africa constrain their ability to broaden their mix among the various varieties, given the apparent price differentials, as a way of maximizing revenues (ADB, 2010).

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C. Arabica is believed to be originated from Ethiopia and hence, the country has enormous potential to sustainably supply quality coffee with diverse type to the world market. The coffee types of Ethiopia that are distinguished for their very fine quality, with unique aroma and flavor characteristics include Harar, Sidamo and Yirgachefe types (Workafes and Kassu, 2000). However, coffee growers in Ethiopia have been exposed to price fluctuations and impacts of unpredictable and uncontrollable shocks (Samuel G. and Eva L., 2008).

Ethiopia is the leading C. Arabica producer in Africa, ranking the fifth largest Arabica coffee producer and tenth in coffee export worldwide (ICO, 2014). In 2012/2013 about 528,751.11 ha of land were covered by coffee, from which about 2.8 million kenton of clean coffee was produced. However, coffee production area of 2011/12 cropping season were 515,882.46 ha from which about 3.8 kenton of coffee were harvested. This showed that area of production was increased by 2.49% from 2011/12 to 2012/13 cropping season while its total harvest was decreased (CSA, 2013).

The importance of coffee in Ethiopia is clear because it is one of the most valuable primary products in country trade and Harar coffee fetches premium prices in the world market. It contributes about 10% of the total country’s coffee acreage and 8% of the country’s coffee export (Desse, 2008). In Harar, coffee is produced in highly diversified and it is garden production systems adapted to different ecological conditions. In the area, coffee is intercropped with the different crops like “khat” (Khat edulis), sorghum, maize, beans and sweet potato. Farmers of the area grow coffee landraces having their own characteristic features (Bayeta et al., 2000).

Hararghe is endowed with enormous genetic diversity and different coffee types with unique taste and flavor. The region also possesses conducive agro-ecological and socio-cultural conditions for coffee production. Despite the immense potential, productivity and quality of coffee production remained low. In West Hararghe average productivity is 512 kg/ha which is below the national average (Anteneh T., 2011). Therefore, assessing factors influencing coffee production and productivity was used to develop appropriate technology for improvement and inform policy makers to understand the gap. Hence, this study was intended to identify constraints and opportunities of coffee production in west Hararghe zone of Oromia regional national state.

METHODOLOGY

Description of the Study Areas

The study was conducted in three districts such as Daro Lebu, Habro and Boke of west Hararghe zone. Darolebu is located at 8°10’N40°30’E and bordered on the south by the Shebelle River which separates it from the Bale Zone, on the west by the Arsi Zone, on the northeast by Guba Koricha, on the north by the Habro, and on the east by Boke districts (Abdi, et.al, 2013). The district is characterized mostly by flat and undulating land features with altitude ranging from 1350 up to 2450 m.a.s.l. The minimum and maximum temperature of the district ranges from 14 to 26°C with average of 16°C while average annual rainfall is 963 mm/year. Most part of farming land is meant for production of coffee and chat (Khat edulis L.) which are the most common cash crops in the district. Income of smallholders households in the district mainly depend on coffee production. Other major crops like maize, sorghum, groundnut and haricot bean were mostly intercropped in coffee or chat farms in the district (Daro Lebu District Agricultural office, 2013).

Habro district was located at 404 km east of Addis Ababa, capital city of Ethiopia and 75 km south of Chiro, West Hararghe Zone town. The district boarded with Guba Koricha district in west, Boke in east, Daro Lebu in south and Oda Bultum in north. The altitude of the district ranges between 1600-2400 m.a.s.l with maximum and minimum temperature of 16°C and 20°C, respectively. The district receives annual average rainfall of 650mm to 1000mm (Aman T and Anteneh T, 2010). Major food crop grown in this district were maize, sorghum and haricot bean while coffee and Khat were major cash crop grown by smallholder farmers. Boke is one of districts of West Hararghe zone known for coffee production. It is located at 391 km east of Addis Ababa and about 69 km south of Chiro, capital town of the zone. The altitude of the district ranges between 1762-1855 m.a.s.l. The district receives an average annual rainfall of 850 mm while average temperature is 20 °C. Boke is one of districts of West Hararghe zone known for coffee production. It is located at 343 km east of Addis Ababa and about 17 km south of Chiro, capital town of the zone. It shares borders with Chiro district in the west and north, Oda Bultum district in the south and Mesala district in the east. The district is found within 1300 to 2400 meters above sea level (m.a.s.l). It receives an average annual rainfall of 850 mm and the average temperature is 20 °C (Boke District Agricultural office, 2013).

Sample and sampling method

The population for this study comprise of all coffee producing households in the selected kebeles of Daro Lebu, Boke and Habro districts of west Hararghe zone. This study employed multi-stage sampling procedures. In the first stage, the districts were selected purposively based on coffee production potential from west Hararghe zone. Accordingly, Daro Lebu, Habro and Boke were selected with collaboration of Zonal experts purposively
Table 1. Average land holding and land under coffee production in Hectare West Hararghe zone, 2013

<table>
<thead>
<tr>
<th>Variable</th>
<th>Daro Labu</th>
<th>Boke</th>
<th>Habro</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td>Average landholding(Ha)</td>
<td>0.95</td>
<td>0.55</td>
<td>1.1</td>
</tr>
<tr>
<td>Land allocated for coffee(Ha)</td>
<td>0.35</td>
<td>0.25</td>
<td>0.37</td>
</tr>
</tbody>
</table>

Table 2. Age and coffee production experience of households in West Hararghe Zone, 2013

<table>
<thead>
<tr>
<th>Variable</th>
<th>Daro Labu</th>
<th>Boke</th>
<th>Habro</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td>Age in a year</td>
<td>40.16</td>
<td>14.29</td>
<td>40</td>
</tr>
<tr>
<td>Farm experience in a year</td>
<td>18.02</td>
<td>12.5</td>
<td>17.58</td>
</tr>
</tbody>
</table>

based on coffee production potentials of the zone. In the second stage, three kebeles from Daro Lebu, two kebeles from Habro and another two kebeles from Boke district were selected randomly by considering number of households producing coffee in each district. Finally, a total of 170 households were selected which consists of 61, 57 and 52 households from Daro Lebu, Boke and Habro districts, respectively.

Data Sources and Collection Methods

Data for the study were collected from both primary and secondary sources. Primary sources of data were collected through household survey with structured questionnaires while secondary data were collected both from published and unpublished source.

Methods of Data Analysis

The data were coded and entered into SPSS version 20 software for statistical analysis and management. Descriptive statistics like mean, standard deviation, frequency distribution and percentage were used to understand the socio economic situations and constraints of coffee production of the sample respondents of the study area.

RESULT AND DISCUSSION

Socio economic Characteristics of Households

Households in the study area use their land for all farming activities which include; production of food crops and cash crops, house construction, tethering livestock and tree planting. The average landholding size in the study area ranged from 0.75 to 1.1 ha (Table 1). In terms of allocation, land allocated for coffee production was 0.35, 0.37 and 0.4 ha in Daro Lebu, Boke and Habro, respectively (Table 1).

The mean age of households was 40.16, 40 and 41.35 years in Daro Lebu, Boke and Habro, respectively while farming experience of households on coffee production reported as 18.02, 17.58 and 20.96 in a year (Table 2). This study also revealed the most of farmers in the study area have more experience of coffee production practices.

Table 3 below indicated that 70.5% of total sample respondents were illiterate 29.5% of them were literate at Daro Lebu district. Similarly, 73.7% of respondents were illiterate 26.3% were literate at Boke while 69.2% illiterate and 30.2% literate at Habro. In this study, high percentage of illiteracy showed that there was a problem of adopting new technology to boost production and productivity of coffee in the study area.

Coffee Production Constraints

In the study area Coffee was mainly grown as an intercropping system with different crops like sorghum (7.2%), maize (67.1 %), haricot bean (5.9%) and rarely with Khat edulis (3.5%). The results of the survey revealed that farmers of the area grow different coffee landraces which are low yielder and poor in their resistance toward disease, pests and drought problems. According to farmers the productivity of coffee decreased from time to time, due to lack of improved varieties in the study area.

The result of the study (Table 4) revealed that farmers in the study area mostly grown Shumbure landrace of coffee due to its resistance to different diseases especially Coffee berry Disease (CBD) which is economical disease of coffee producing area of west Hararghe zone (Table 5). Even though about 22.4% of...
Diseases and pests are causing considerable crop losses in the study areas. For instance, coffee berry disease is major disease observed on most farmers farm while coffee wilt disease was minor disease observed on coffee farm of few farmers (Table 5). On the other hand farmers reported that coffee production was hampered by different pest problems in the study area. The major pest which affects coffee production was coffee stem borer and coffee berry borer (Table 5). Hence, due to these problems the farmers in the study area suffer to economic problems and forced to replace their coffee with other crops. Similar achievement was reported by Mekurie et.al, 2004 and Yves, 1999 indicated that due to market fluctuation, drought, disease and pest damages; farmers were forced to uproot coffee tree and replace by other local cash crops like *Eragrostis tef* and *khat edulis*.

Farmers also indicated that due to severe disease impact especially Coffee Berry Disease on coffee production; they forced to replace their coffee farm with *Khat edulis* which is not affected by disease and highly drought resistance than coffee. The average land under coffee production was 0.37ha while for Khat was 0.3ha which indicated that *Khat edulis* is the most competing cash crop regarding land allocation with coffee currently in the study area (Table 6). From this one can concluded that *Khat edulis* production imposed difficulty on coffee production in the study area.

### Institutional Constraints of Coffee Production

As described above, coffee production and productivity of smallholder farmers vulnerable not only by problems like diseases and pest-insect in the study area but also an institutional factor plays greater role in coffee production system.

Because this study reflected that 57.6% of coffee producers sells their product immediately after harvest due to lack of storage facility (Table 7). Even though some farmers store their coffee to six month/ one year for better price, most households encountered yield loss. About 67% of households sell their coffee product at village market to retailer and collectors. Because of poor access to market information, farmers reported that retailer and collector decide price for their product. This indicated that farmers sell their product to lower price as
they did not have any alternative actors to whom they sell their product in the area.

Smallholder coffee farmers in the study area have limited access to market information, physical infrastructure (road, storage facility and transport facilities) and training opportunity concerning coffee production and management. For instance, 57.6% of the respondents didn’t have access to market in formation and similarly, 64.1% of them didn’t have access to road facility to sell their product on market (Table 8).

There is no doubt that technological advances can play an important role in increasing production and productivity as well as contributing in other areas such as quality improvement and plant protection (ICO, 2002). This study revealed that lack of improved variety is major constraint which directly reduces coffee production and productivity in the study area. Most households (>96.5%) still cultivate coffee varieties, which they inherited from their parents (local landraces). Inadequate supply of high quality coffee seeds still remains a major barrier to Ethiopia coffee growers, mainly due to the absence of a formal coffee seed system in the country (Taye et al., 2011) which in line with the result of this study.

It is also important to note that extension service is important factors determine production and productivity of smallholder farmers. Empirical results revealed that extension contact has an influence on farm households’ adoption of techniques to improve production (Nkonya et al., 1997). However, this study revealed that, poor of extension service is one of the constraint that affect coffee production and productivity. About 64.7% of coffee farmers not have access to extension service concerning coffee production and productivity while only 33.3% reported that they have access to extension service (Table 8). The respondent reported that, the only organization providing extension service are District Agricultural Office and recently Mechara Agricultural Research Center concerning coffee production and management. This indicated that lack of organization providing extension service for coffee farmers is other constraint of coffee production in the study area.

In addition to the above listed constraints of coffee production, households also reported that land shortage, decline of soil fertility, prolonged drought, lack of credit services and competition of other cash crop like Khat edulis, are also hinder coffee production in the study area.

**Opportunities of Coffee Production in West Hararghe**

Coffee production is the major income generating cash crop to feed households in the study area. High quality of Harar coffee, high demand of Hararghe coffee on world market, construction of rural road to connect rural Kebele to market place, availability of network in rural area, good indigenous knowledge of coffee production, introduction of improved variety of coffee by some organization recently in the study area were an opportunity for coffee production. Farmers in the area were interested in using improved coffee production system and incorporating their indigenous knowledge with improved practice because they were supposed that with existed potential indigenous knowledge on coffee production, it will improve their production and productivity.

**CONCLUSION**

The finding of the study showed that average land holding size of households were less than one hectare.
which indicated that land scarcity is major problem for coffee production. The study also revealed that coffee and Khat edulis were the major cash crop competing to each other regarding land allocation. This study also revealed that most of households in the study area were illiterate which affect coffee production directly. However, farmers in the study area have strong indigenous knowledge on coffee production.

Even though coffee is major cash crop produced in the study area, its production and productivity were hampered by different constraints. The study concludes that both biological and institutional factors play greater role in coffee production. Diseases, Pest, insect, poor access to market information, lack of physical infrastructure, lack of improved coffee variety and poor extensions services were the major constraints of coffee production. However, high quality of Harar coffee, high demand of Hararghe coffee on world market, construction of rural road to connect rural Kebele to market place, availability of network in rural area, good indigenous knowledge indicated as future perspectives for coffee producers in the area.

**RECOMMENDATION**

Based on the results of the finding, the following recommendations were forwarded by the author to improve coffee production and productivity in the study area.

Most of coffee landraces grown by growers in the study area were susceptible to different disease, pest and insect problems. Because of this coffee growers forced to change their coffee farm to ‘Khat Edulis’ farm. Therefore, research institutions have to give special emphasis for development of environmentally friend and resistant coffee variety for growers to keep coffee production sustainability in the study area.

Coffee growers in the study area grow coffee for many years with their own indigenous technical knowledge which they inherited from their ground families. Therefore, assessment of farmers’ indigenous technical knowledge on coffee production was required to improve coffee production and productivity through integrating it with scientific knowledge invented from research side.

To improve coffee production and productivity in the study area, provision of extension services for producers was important factors. However, weak extension service concerning coffee production was reported as major constraint by growers. So, government should provide special services for growers to improve their skill and knowledge on coffee production aspect and improve livelihoods of households in the study area. Enhancing infrastructural and institutional facilities (e.g. market information, transportation and road) were another area need emphasis to increase growers share from their product.

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