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CASE REPORT

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Coffee Seed Production and Supply at Research Centre in Ethiopia

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ABSTRACT

Farmers' access to use of improved coffee seed could make a significant difference in increasing coffee seed production and productivity. The objective of this study to define the quantity demanded and production of a coffee seed the year 2014/2015 and illustrate it using a graph at research institute in Ethiopia. For money years, Jimma Agricultural Research Centre had a programme to persuade and distribute released coffee seeds to farmers in South, South West, Southern parts of the Country and West Hararghe areas. Being one of the major tasks to do technology multiplication division, had to produce efficiently a good quality improved coffee seed and distributed to the end users at affordable price. A total of 174qt coffee seed produced with area coverage 30.0ha from Federal and Regional Research. Sources of improved coffee seed could not meet the ever increasing demand for coffee seed by small-holder farmers. Farmers do not keep at seed stock until the next season and farmers to farmers seed supply is far from satisfactory in availing improved seed due to long time storage it leads to reducing germination percentage and viability. Alternative and innovative seed systems have been needed to change this trained. Since various factors including farmers groups, extension service

providers, financial institution, farmers' cooperative partnered together with a research to avail quality packaged seed in sufficient quantity.

Extension agents must do awareness creation to the end users of technologies to produce and supply quality coffee seed to the nearby community.

Keywords: Improved Coffee Seed, Productivity, Supply and Ethiopia.

INTRODUCTION

Coffee is an important foreign earning commodity to the country. Besides, 15 million people are dependent on coffee for their livelihood from these 8 million people directly involved in coffee cultivation. Moreover, the livelihood of a quarter of the Ethiopian population depends directly or indirectly on the different processes of production and marketing along the coffee (Girma et al., 2008). In Ethiopia primary centre of origin and genetic diversity for many plants, *arabica* coffee is the most popular cash crop, 70% of the total coffee production and over 90% of the world market. Coffee is mainly producing the south-west, south-east and south parts of the country. In these areas found the famous coffee types including *Yirgacheffe*, *Sidama*, *Harar*, *Limmu*, *Gimbi* coffee types. It has minimum productivity, but unique superior quality. There is different Arabica L. coffee cultivars with desirable agronomic traits (yield, vigor, growth habit, yield stability, quality, resistance to disease and insects, drought tolerance, etc.).

Jimma Agricultural Research Center established, in 1967, since its establishment the center has multiplied several crops varieties especially different coffee varieties. Seed production was in most other crops done by Ethiopian Seed Enterprise and Private seed producers. The only research center who has a mandate to produce genetically pure seed of Arabica coffee in the country is Jimma Agricultural Research Center (JARC). Farmers initiate to produce improved coffee varieties that are resistant to

diseases and given to the farming community as a seed source. For money years, Jimma Agricultural Research Centre had a programme to persuade and distribute millions of the released coffee seeds to farmers in south, the south-west, south-east and West *Hararghe* parts of the country. Though, the demand and supply of coffee seeds are incompatible. Up to date the centre identified 37 improved varieties from which 23 pure lines, three varieties for *Sidama* / *Yirgacheffe*, four for *wellega*, four varieties for *Hararghe* and other three are hybrids. In Ethiopia, the overall land area devoted to coffee production due to new planting is increasing and estimated to be 662,000ha, of which 496,000 ha are productive. The average annual production is 350,000ton and productivity of about 0.71t/ha (Alemayehu et al., 2008). Improved agronomic package technologies (nursery, forest & garden based coffee management) can be used but clean coffee seed yield from 12 up to 24 q/ha at research centre and from 6 up to 10 on farmers field it indicates a minimum as compared to the area coverage.

The minimum productivity of coffee seed has been attributed to several factors including inherent low yield potential of the existing varieties, susceptibility of varieties to forest and terminal drought, cultural practices, high year to year yield instability because of climatic or environmental condition. The low-input supply of coffee production system with the occurrences of maximum biodiversity, environmental sustainability and ecological services (Taye, 2010) should

deserve due attention and need to be supported, among other, through smallholder certification and carbon trading. The capacity of the formal sector is limited to supply the nations demand and the traditional one (informal system) is incapable of producing improved quality seed in the existing situation. Involvement of farmers in seed/seedling multiplication has many benefits including increasing agricultural production through increments in productivity, increasing the income of small-scale farmers and improving agricultural seed and other input markets. The objective of this study report was to compare demand and production of coffee seed.

MATERIALS AND METHODS

Coffee seed production and distribution mainly undertook by Jimma Agricultural Research Center, which is the national mandate to facilitate the overall coffee research in Ethiopia. The status of coffee seed production was analyze for the released coffee varieties. From the annual requests for each variety and supplied by the Jimma Agricultural Research Center, the gaps between the demand and production was described and compared with in a year. Planting was carried out according to the crops calendar; all recommended agronomic practices applied. Fields well prepared, the seed orchard was slashed, pruned, fertilizers applied, etc., to get adequate and quality coffee seed. Harvesting red ripe cherries then processing (pulping the harvested red-ripe cherries with machine carefully, washing by clean water, removing husks and broken seeds) drying takes place at shade, the moisture content was also measured (14-18 percent optimum for coffee seed for storage), all unwanted seed removed (*pea-berry* and broken) before packing the sack, germination percent and all other seed quality parameters should be labeled

then tagging was carried out consequently. Distribution takes place as per the official letter request of the Governmental Organizations, Private limited Companies and NGOs to the end user.

RESULTS

Thus, JARC is the only Governmental institution that had taken initiative of multiplying improved coffee seeds of the nationally released CBD resistant varieties since 1987 and distributing all over the coffee growing areas of the country. JARC not meet the rapid growing demand for improved coffee varieties in the country as described by Nugusie et al., 2008. Many stakeholders required different types of seeds by suitability of the agro-ecological zone, the more demanded region major production area of coffee seed Oromiya Region State and South Nation Nationalities of Ethiopia (*Debube* Region). From fifteen varieties of coffee seed required by different stakeholders, almost all the varieties were known and requested at a larger amount from South Nation and Nationality of Ethiopia than Oromiya Regional State. As compared to all other varieties Farmer's perceptions so higher on 74110 & 74112 requested by different stakeholders that coffee seed had wider known and adaptation range than others. On the other hand, newly released varieties like locally known as *Gesh* adapted grown low-land areas, *Gawain* (hybrid), *wesh-weshi* and *buno-weshi* which were grown highland areas it required below one thousand kilogram (minimum demand or perceptions than others (**Figure 1**)).

In general the majority of coffee seed growing farmers use local landrace for planting purposes. The contribution of other seed sources is limited. Therefore, to have a significant impact on the wider dissemination of improved coffee varieties, the involvement of local seed

producers, traders and cooperative in seed production and distribution should be encouraged.

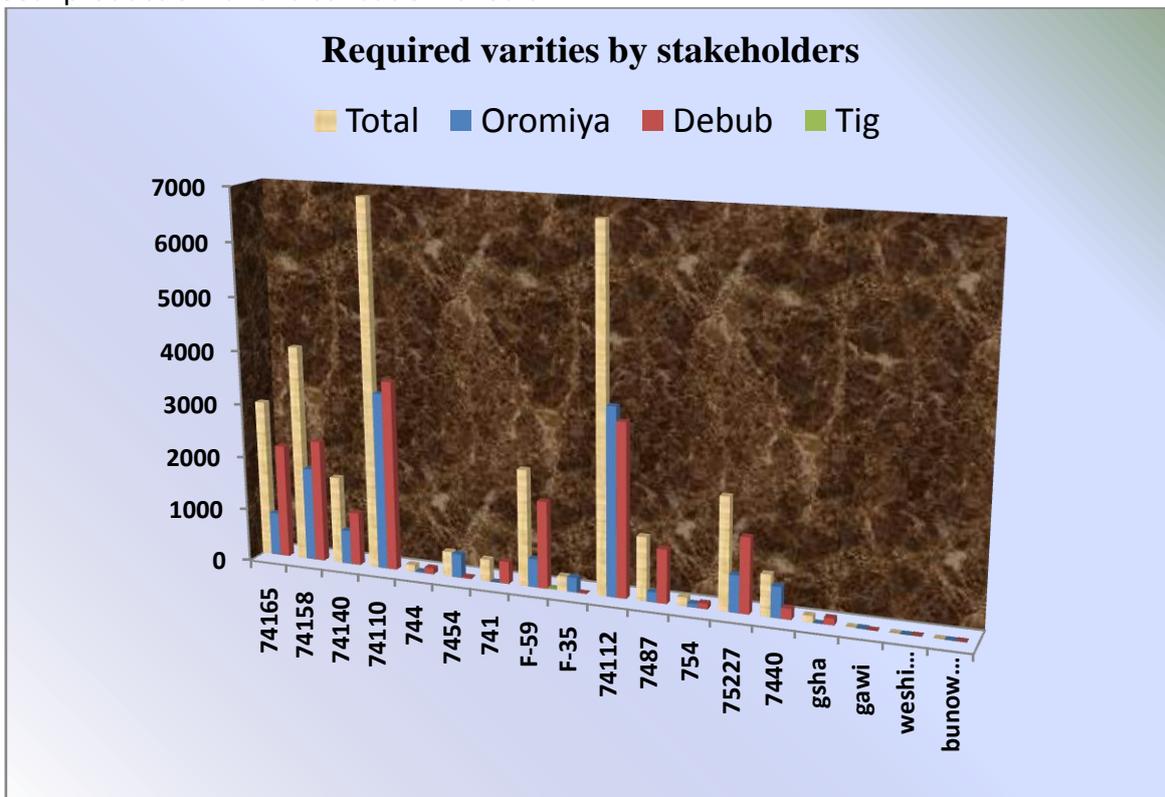


Figure 1. Required Amount of coffee seed differentiates between regions in 2014/2015 cropping seasons.

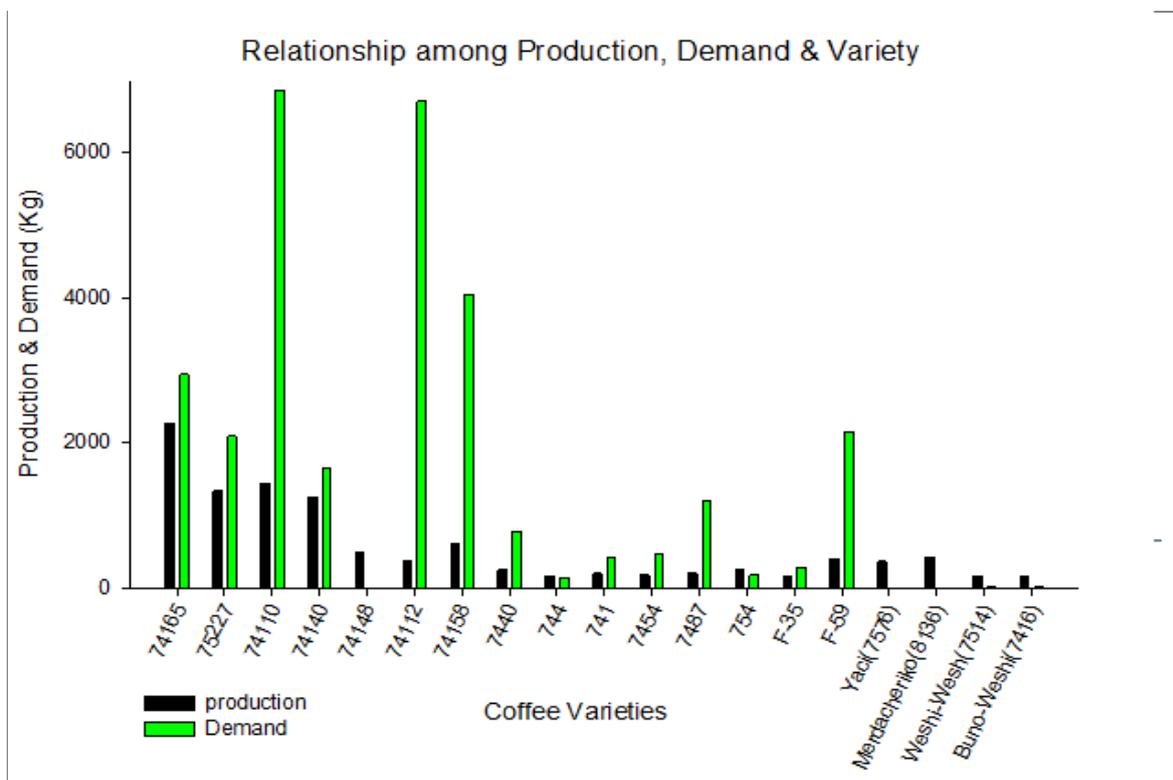


Figure 2. Trends of improved coffee seeds produced and supplied at JARC in 2014/2015 Cropping Season.

Production Vs Demand of coffee seed

Production of coffee seed varies by season, in 2014/2015 cropping season a total of 174 quintals (qt) produced from different agro-ecological regions, and almost all varieties productivity was lower than 20.0qt. At research centers, coffee seeds were mainly produced from coffee seed orchards of the released and adaptable coffee varieties established and managed by the division of technology multiplication and seed research process, as well as from the varied collaborative regional research centers. As indicated figure 2, the production of coffee seed greater than one thousand kilograms only four varieties (74165, 75227, 74110 & 74140), in other ways, all others produced in 2014/2015 cropping year below one thousand kilogram. The demand for improved coffee seeds was rapidly growing. According to the data analyze in 2014/2015 Crop years, the ever increasing annual request for coffee seed was coming from the various zonal agriculture bureaus, NGOs and private investors from all over the country.

All the varieties require from different region so higher than production, the highest demand recorded on the varieties 74110 and 74112, the lowest was locally known as *yaci*, *merdacherico*, *weshi - weshi* and *buno - weshi* these newly released has need higher popularization, demonstration and scaling up to the end users.

Production of coffee other than seed

No more preparation of coffee for consumption purpose at Research Center only for seed, Ethiopia, however, it can be prepared from unwanted fruits from seed fields. It takes 3 or 4 years for the newly planted coffee trees to begin to bear

fruit/seeds. The fruit, called coffee cherry, turns a bright, deep red when it is ripe and ready to be harvest. At JARC, the coffee crop is picked by hand, a labor-intensive the landscape is relatively 5% sloppy and the coffee fields immense. Once the coffee has been picking, processing must begin as quickly as possible to prevent spoilage. Depending on location and local resources, coffee is process in one of two ways.

Dry Method

This is the old coffee processing method and is still use. The picked cherries are simply spread out on huge surfaces to dry in the sun. To prevent the cherries from spoiling, they are raked and turned throughout the day, then covered at night, or if it rains. Depending on the weather, this process might continue for several weeks for each batch of coffee. When the moisture content of the cherries drops to 11 percent, the dry cherries are moved to warehouses where they are store.

Wet Method

In wet method processing, the pulp is removed from the coffee cherry and the bean is dry with only the parchment skin left on. There are several actual steps involved. First, the freshly harvested cherries are passed through a pulping machine where the skin and pulp are separate from the bean. The outer cover of fruit is washed away with water. The beans are separate by weight as they are convey through water channels, the lighter beans floating to the top, while the heavier, ripe fruit sink to the bottom. The harvested fruits put into the water holding tanker, pure seed not visible it under the bottom it exceeds processing as the sources of seed but floaters cannot be

used as a seed source. During processing time poor adjustment of machines broken the seeds. And also, harvesting time no longer pick or harvest upper and lower parts of coffee tree then dried at the tree shattering takes place to the ground those

parts of fruit/seeds from the coffee tree are not as a source of seed it can be use consumption purpose. Only use as sources of seed the medium parts and the ripe cherries.

Table 1. In 2013/2014 cropping season other than seed sources, this can be used for consumption purpose.

No.	Consumption purpose	Yield(qt) 2006/2007
1	Clean coffee (from research purpose)	55.54
2	Dry Cherries coffee from upper & lower parts of tree	50.78
3	Dry Cherries shattering from land	33.17
4	Floater (<i>Tensafafi</i>) Coffee during harvesting time (under or over ripe cherries)	11.20
5	Broken (unadjusted machines broken during pulping)	3.83
6	Broken during cleaning and drying time	6.46
	Total	160.98

CONCLUSION

Ethiopian coffee seed is produced by many small-scale farmers in small quantity. In spite of the growing demand for coffee seed for the domestic markets shortage of seed in the required quantity has inhabited many farmers from the opportunity. But coffee seed demand from investors and farmers is so higher than production what we have. In most cases farmers get few planting materials to plant on the field from external sources either from the bureau of agriculture or privately owned nurseries and a few from research centres. The demand for improved coffee seed varieties is increasing from time to time, but it is very difficult to get enough quantity of seeds to provide to the farmers. This incongruity occurred due to lack of responsible body to provide and satisfy the demand of the coffee farmers. Farmers access to, and use of improved coffee seed could make a significant difference in increasing coffee seed production and productivity. Being one of the major tasks to do technology

multiplication coordination was to produce efficient a good quality improved coffee seed and distributed to the end users at an affordable price. Based on 2014/2015 cropping season a total of 174qt coffee seed produced with area coverage 30.5ha from Federal and Regional Research Centre and distributed to the end users. But coffee seed demand from investors and farmers was so higher than production what we have.

In spite of the growing demand for coffee seed for the domestic markets shortage of high-quality seed in the required quantity has inhabited many farmers from the opportunity. Sources of improved coffee seed could not meet the ever increasing demand for coffee seed by farmers. Farmers do not keep seed stock until the next season, and farmers to farmers seed supply were far from satisfactory in availing improved seed due to long time storage it leads to reducing germination percent and viability.

An alternative and innovative seed system various factors including farmers groups,

extension service providers, financial institution, farmers' cooperative partnered together with a research institution to avail quality packaged seed in sufficient quantity. Extension agents must do awareness creation to the end users of technologies to produce and supply quality coffee seed to the nearby community. The major coffee producers, the smallholders, did not benefit much from the available improved coffee research technologies due mainly to weak extension services and considerable improvement is required in this regards.

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