

Coffee Farmers Socio-Economic Status, Problems Encountered and Potential Intervention for the Enhancement of the Coffee Industry in Balbalan, Kalinga, Philippines

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Abstract: This study dwelt on the farmers' experience in coffee production, harvesting, post harvesting and marketing in Balbalan, Kalinga. The study consisted of three components, namely: 1) description of the socioeconomic characteristics of the coffee farmers; 2) description of the coffee production, harvesting, post harvesting and marketing practices; 3) assessment of the problems encountered and potential interventions to improve the coffee industry.

The coffee farmers are generally 43 years old, have at least with 2000m² of coffee farms and medium (5 members) household size. Researchers have identified eight challenges and potential interventions in the coffee production, harvesting, post harvesting and marketing.

Keywords: Coffee industry, coffee farmers, coffee production, coffee postharvesting and marketing.

I. INTRODUCTION

Coffee is a woody perennial evergreen shrub thriving very well in hot wet tropical parts of the world and a dicotyledonous plant of the Rubiaceae family with different varieties like *Arabica*, *Robusta*, *Liberica* and *Excelsa*. It has a main orthotropic trunk and plagiotropic branches. *Coffea arabica* (Arabica) and *Coffea canephora* (Robusta) are the two main species cultivated today. *C. arabica* accounts for 75-80 percent of the world's production while *C. canephora* is more resilient than arabica but produces an inferior tasting beverage (<http://www.new-agri.co.uk>).

With higher coffee prices in the international market, the desire for a profitable cash crop means, stakeholders often encourage farmers in traditional coffee growing areas to "increase their production while advising those in non-traditional areas to establish coffee farms" (CoDF, 2012).

Imports of coffee beans in CY 2003 and 2004 were adjusted upwards consistent with trade data from the Philippine National Statistics Office (NSO). Vietnam supplied over 94 percent of the total Philippine coffee bean imports. From virtually no imports in 1996, Philippine imports grew to nearly 19,000 MT of coffee beans in CY 2003 and 2004 valued at \$15 million (National Statistics Office). Without significant increases in coffee production and with continued strong growth in domestic coffee consumption, coffee bean imports will likely remain high, nearly 40 percent of total domestic requirement. Coffee bean imports in CY 2004 and 2005 are forecast to remain roughly at the same levels. In 2011, export volume stood at 405 tons down by 30.7 percent from 2010 (Department of Agriculture, 2013).

Philippine coffee production and exports has declined in recent years due to factors such as low buying price, out-dated production practices, unproductive coffee trees, diversification into other crops, as well as lack of post-production and processing facilities.

The Philippines is a relatively small coffee producer with output less than one percent of global production. Philippine coffee production in 2010/11 is expected to decline between 5-6 percent to 25T MT in green bean equivalent due to some shift from coffee farming to rubber and bananas in Mindanao. The Philippines is a net coffee importer, 2010/11 imports of coffee beans are expected to decline but will still remain at over half of total supply due to limited domestic production. Soluble coffee imports on the other hand, particularly from Indonesia, rose tremendously from 19.3 TMT to over 40.2 TMT last year and are forecast to continue to increase (Ang, undated).

ICO outlook for coffee in the Philippines revealed decreasing production from 380,000 cavans (60kg) in 2010 to only 158,000 cavans in 2019 while increasing in terms of consumption from 1,078,000 cavans in 2010 to 1,389,000 cavans by 2019.

Kalinga province is blessed with ancestor who planted coffee trees in their ancestral domain. Today, the province has 11 coffee processors which command more raw materials to sustain its production dubbed as organic coffee. However, the coffee industry particularly in yield productivity is declining which can be attributed to over mature trees, unmanaged or neglected coffee trees, inefficient harvesting and post harvesting practices, and insufficient labor force. The coffee plant is the number one plantation crop in Kalinga (PPDO-Kalinga, 1999) besides being its One-Town-One-Product commodity as reflected in DTI, Philippines website.

From the above, it is therefore important to dwell on basic researches on coffee production, harvesting, post harvesting and marketing practices of coffee farmers in Balbalan, Kalinga, Philippines.

Objectives of the study:

Generally, the study aims to generate baseline data on the socioeconomic status of coffee farmers, their coffee production, harvesting, post harvesting, and marketing practices in Balbalan, Kalinga, Philippines.

Specifically the study aims to:

1. determine the problems encountered by the coffee farmers in the production, harvesting, post harvesting and marketing; and
2. Identify intervention to improve their production, harvesting, postharvest, and marketing practices.

II. METHODOLOGY

Research Design:

The study used the descriptive method of research with a questionnaire as the primary research tool for gathering the needed data. The data gathered was used in determining the practices of farmers in the production, harvesting, post harvesting, storage and marketing of coffee. It involved the collection, collation and interpretation of data and answering questions for the attainment of the objectives of the study.

Research Environment:

The municipality of Balbalan is one of the coffee producing areas in the province of Kalinga. DAR-ARCESS project had been introduced in the area in order to improve crop productivity in the areas covered by the Comprehensive Agrarian Reform Program of the government. Twenty eight farmers which are the trainees for agricultural technician for coffee coming from the different barangays of the municipality served as the source of information.

Research Methods:

The questionnaire was used to gather pertinent data relevant to the study. The respondents were the trainees for agricultural technician for coffee.

The demographic profile was obtained to describe the demographic characteristics of the respondents such as age, coffee farm size, and household size.

Research Instrument:

A questionnaire was used in the study. Salient features of the questionnaire include the following:

Part I. Demographic characteristics of the respondents.

Part II. Production, harvesting, post harvesting, storage and marketing practices employed by the coffee farmers; the problems encountered and the interventions for yield productivity of coffee farms in Balbalan, Kalinga, Philippines.

Statistical Analysis:

The data gathered were analyzed by means of descriptive statistics with the use of Microsoft Excel.

Descriptive statistics was used in describing the nominal data. The data was analyzed and presented through measures of central tendency such as frequency, mean and percentages.

III. RESULTS AND DISCUSSION**Demographic Characteristics of the Respondents:**

A total of twenty-eight (28) farmer technician trainees served as the respondents in this study.

TABLE 1. DISTRIBUTION OF THE RESPONDENTS AS TO AGE

Age	Frequency	Percentage
30-45	12	42.86
46 and Above	16	57.14
Total	28	100.00
Mean	43	

Age:

Majority (16 or 57.14%) of respondents belonged to bracket 46 and above years of age, while 12 (42.86%) belonged to age class 30 to 45 years. The respondents' average age is 43 years old which shows that coffee farmers belong to the middle age.

TABLE 2. DISTRIBUTION OF THE RESPONDENTS AS TO FARM SIZE

Farm size	Frequency	Percentage
Less than 0.50 hectares	20	71.43
0.50 hectares and above	8	28.57
Total	28	100.00
Mean	2000m ²	

Farm size:

On the farm size of the respondents, Table 2 revealed that 20 (71.43%) owned less than 0.50 hectares, while 8 (28.57) owned more than 0.51 hectares. They have an average farm size of 2000m² coffee production areas. According to the Department of Agriculture, Philippines (2013), the farm size of 1.5 hectares or less is classified as smallholder, hence most coffee farmers in Balbalan belong to smallholder type of farm.

TABLE 3. DISTRIBUTION OF THE RESPONDENTS AS TO HOUSEHOLD SIZE

Household Size	Frequency	Percentage
2 and below (small)	6	21.43
3-5 (medium)	12	42.86
6 and above (large)	10	35.71
Total	28	100.00
Mean	5	

Household size:

The household size was categorized based on the study of Torres (1992) as cited by Francisco (1995), 2 and below (small), while 3-5 (medium) and 6 and above (large). Of this classification, 12 (42.86%) belong to medium size household, while 10 (35.71%) belong to large household size and 6 (21.43%) belong to small household size. The results implies that majority of the respondents have medium household size with an average of 5 members.

Practices in production, harvesting, post harvesting, and marketing of coffee:

TABLE 4. PRACTICES IN PRODUCTION, HARVESTING, POST HARVESTING, AND MARKETING OF COFFEE

Practices	Frequency	
	Yes/With	No/Without
1. Propagation		
a. Seedlings	1	
b. Wildlings	20	
c. Unknown	7	
2. Weeding management	5	23
3. Fertilizer application	0	28
4. Irrigation	0	28
5. Pruning	1	27
6. Mulching	5	23
7. Harvesting of berries		
a. Stripping	28	0
b. Picking	0	
8. Drying		
a. Dry method	28	
b. Wet method	0	
9. Storage		
a. Identified place	1	27
b. Use of prescribed sacks i.e. jute	1	27
10. Marketing		
a. In the municipality	2	26
b. Outside the municipality	26	2

Table 4 shows that majority of the respondents' utilized wildlings as source of planting materials. There are seven farmers who do not know the origin of their planting material because they inherited it. Majority or 82.14% of the farmers practiced weeding after harvesting; others have abandoned their farms and just go back during the time of harvesting. This happens because they were disappointed at the low price of the coffee beans. In terms of fertilizer application and irrigation, no one among the farmers have utilized fertilizer and irrigation to their coffee production; they claim their production scheme as "organic by neglect." Only one farmer have employed pruning. While in terms of mulching, those who weed their coffee farms practice mulching. All the respondents revealed to employ stripping in coffee berries harvesting because of numerous reasons such as very tall coffee trees, distance of the farms and others. Farmers employed dry method in drying their coffee berries. Majority uses available sacks in their houses and sold their coffee beans in Tabuk city.

Problems encountered by the farmers:

TABLE 5. PROBLEMS ENCOUNTERED BY THE FARMER RESPONDENTS

Problems	Rank
1. Low yield productivity	1
a. Old coffee trees	(1)
b. No fertilizer application	(2)
c. Insufficient weeding activities	(3)
d. High density of coffee trees	(4)
e. Insufficient labor	(5)
2. Lack/Insufficient farm to market road/transportation	2
3. Inaccessibility to market which command better price	3
4. Absence of drying facilities	4
5. Absence of storage facilities	5
6. Absence of post harvesting facilities like dehuller/pulper	6
7. Inaccessibility to short and long term credit	7
8. Insufficient knowledge on proper harvesting, drying, and storage of coffee beans	8

In terms of the problems encountered, according to the farmers low yield productivity comes first as attributed to different factors such as old coffee trees, no fertilizer application, insufficient weeding activities, high densities of coffee stands and insufficient labor. Old coffee trees decline in terms of its yield productivity due to its multiple branches that are not productive which absorb some of the nutrient required for the fruiting branches. Farmers revealed that they don't apply fertilizer in their coffee farms which is known "organic by neglect," coupled with aging coffee trees. Soils become exhausted in nutrients after years of cultivation. It is important to supplement this nutrient by application of fertilizer to make necessary nutrient available for coffee production. Many studies have been conducted and recommends the use of organic matter or biofertilizers to enhance the growth and yield of plants (Berova, Karanatsidis, Sapundzhieva, & Nikolova 2010; Khaple, Devakumar, Maruti, & Niranjana, 2012; Salih Ati, Hadi, Abdullah Abbas, 2013; & Mulugeta, 2014). Competition among the coffee trees, weeds and unwanted coffee wildlings exacerbate the insufficient nutrient of the farm making more contribution to low yield productivity. This can be associated to insufficient labor for weeding the coffee plantation areas.

Come second is the lack/insufficiency of farm to market road/transportation problems. Farmers revealed that with this difficulty of transportation they are constraint in doing activities of their coffee farms such as weeding, pruning, mulching and other activities.

Inaccessibility to market which command better price is third among the problems encountered. They felt that transporting their products to Tabuk City, Kalinga, Philippines which commands a better price than local buyers in the community makes their life more difficult because it entails additional cost and time for marketing their products.

The picking and drying of coffee berries affect the final quality of the coffee. Majority of the farmers revealed that they strip coffee berries (ripe and unripe were harvested in one time). This practice is contrary to the "Pick Red Campaign" of the Philippine Coffee Board (2015). Red cherries are easier to pulp than green ones.

They also revealed that drying is depending on the available facilities. Because of the absence of drying facilities, oftentimes they dry coffee berries in open area allowing the sunlight to reduce moisture; however, coffee berries are left in the open area for 24 hours which sometimes absorb rains. These processes of drying degrade the quality of coffee beans which result to lower price.

Absence of storage facilities in their area is also a problem. Coffee beans should be contained in standard bags and should be properly stored in a dry, ventilated and rain proof areas until sale. Farmers' practice revealed that any container or sack available at home is utilized and there are no designated areas for coffee storage which allows diffusion of some flavor which degrade the quality of a cup of coffee.

Absence of post harvesting facilities like dehuller/pulper is another constraint. They revealed that they used drying method and utilized mortar and pestle in the dehulling activities contributing to the breakage of some beans. The inclusion of these broken beans degrades the quality of the entire coffee beans produced.

Inaccessibility to short and long term credit is another challenge. Farmers revealed that because coffee bear fruits once year, they have difficulty in persuading credit institution to lend them money for the improvement of their production activities.

Insufficient knowledge on proper harvesting, drying, and storage of coffee beans is recorded a problem. Though they revealed that they have experiences that picking the ripe berries will give them better aroma and flavor, the traditional harvesting which is stripping is still employed. These practices of strip harvesting, improper drying and storage contribute to the degradation of the coffee quality.

Potential interventions to improve the coffee industry in Balbalan:

TABLE 6. POTENTIAL INTERVENTIONS AS PERCEIVED BY THE FARMER RESPONDENTS TO IMPROVE THE COFFEE INDUSTRY IN BALBALAN

Interventions	Rank
1. Linkage to market with better price	1
2. Construction of trails/roads from farm to market	2
3. Training on coffee rejuvenation and establishment of demonstration farm	3
4. Provision of quality planting materials for coffee plantation expansion	4
5. Training on proper harvesting and post harvesting activities	5
6. Supporting livelihood diversification for income and food	6
7. Linking to some short and long term credit	7
8. Provision of training and establishment of demonstration area for nursery and plantation	8

Like other agricultural venture, there are interventions necessary to deliver better quality and yield productivity. Among the first intervention is the linking of farmers to market which commands better price. They exposed that when market price of coffee becomes high and stable, they will be energized to revitalize their coffee farms. Another is training them to produce quality planting materials through the utilization of organic matter or vermicompost as recommended by Caliton (2015).

Their difficulty in the transportation of coffee berries and farm implements could be address by the construction of trails or roads. This will make their farms accessible which will give them more time in agricultural activities to increase production.

Because of previous experiences, they agree that old coffee trees must be rejuvenated. They have seen some coffee farms where this technology was implemented and became successful by increasing coffee yield. They opined that trainings on rejuvenation should be conducted and a demonstration farm be established in their barangay which will serve as model coffee farm. Filipinos are still strong in “to see is to believe” mentality.

Provision of quality planting materials for coffee plantation expansion is another intervention because there are still potential areas for expansion. As revealed earlier, their coffee farms were inherited from their forefathers whose used mostly wildlings as planting materials. There are various advantage of using seedlings such as balance root and crown systems and many others.

Training on proper harvesting and postharvesting activities is also an important intervention. They agree that they need to prove this by separating a coffee cup from mixed coffee beans (ripe and unripe berries) to that of pure ripe berries to change mind set of coffee farmers on the effect of improper harvesting. Establishment of storage facilities, provision of drying and postharvesting equipment such as dehuller or depulper is warranted.

Coffee is a perennial crop which bear fruits once a year. Introduction of additional livelihood activities as an intervention is necessary. According to farmers there is limited opportunity to introduce other crops in the coffee farms because of the ruggedness of the area.

Linking to some short and long term credit is another intervention which can help farmers source out some materials necessary for improving productivity.

Though the municipality of Balbalan is identified as a source of coffee beans in the province of Kalinga, nursery is still insufficient or nothing at all making coffee seedlings unavailable for interested farmers to established new farms. Provision of training and establishment of demonstration area for nursery and plantation is necessity which will serve not only as demonstration and learning area but source of quality planting materials.

IV. CONCLUSIONS

Based from the results of the study, the following conclusions were drawn:

1. Majority of the respondents aged above 43 years old, with less than 0.5 hectare of farm size, and average household size of 5.
2. In the production practices, majority utilized wildlings as planting source. They do not practice weeding management, fertilizer application, pruning, mulching, practice stripping in the harvesting, dry process in drying, without identified place for storage including prescribed sacks, and market their products outside the municipality.
3. The farmers identified 8 problems with low yield productivity as the major problem.
4. The respondents identified 8 potential interventions with linkage to market with better price as priority.

V. IMPLICATIONS AND RECOMMENDATIONS

The study revealed that the respondents have utilized traditional farming practices in coffee production, postharvest processes and marketing. Based from the findings of the study, the following recommendations were drawn:

1. Conduct intensified training to farmers on coffee production, postharvest processing and marketing to improve yield and quality of coffee beans.

2. Establish demonstration farm especially nursery, plantation and rejuvenation technology.
3. Link farmers to lending institution to finance the production activities.
4. Link farmers to market with better coffee price.

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