

# The Coffee Value Chain Analysis to Support Farmers Livelihood in Horsik Village, Ajibata Sub-district, Toba Samosir District, North Sumatra

Henry Sitorus<sup>1</sup>, Ria Manurung<sup>1</sup>, Rizabuana Ismail<sup>1</sup>, Roida Lumbantobing<sup>2</sup>

<sup>1</sup>Department of Sociology, Universitas Sumatera Utara, Medan, Indonesia

<sup>2</sup> Department of Sociology, FISHK, IAKN, Tarutung

**Keywords:** Coffee Farmers, Low Income, Capacity and Technology Empowerment, Coffee Processing.

**Abstract:** Coffee is currently very loved by many people. One coffee producer from Horsik village, Toba Samosir is farming on the hills of Lake Toba. This paper describes how to plant and manage Arabica coffee based on local community knowledge. The traditionality of technology that is applied causes low production results so that people's incomes are insufficient for socio-economic life. It is necessary to develop the capacity of farmers' resources and technological support to increase farmers' production and livelihood.

## 1 INTRODUCTION

The history of coffee in North Sumatra started in 1696 during colonialism when Dutch Governor of Batavia (read: Jakarta) received seeds of arabica coffee (Coffee Arabica) from India. Indonesia considered as suitable for coffee plantations because of its position near the equator with mountainous regions across the islands, creating micro-climates for the growth and production of coffee. The first plantation centralized in Java Island managed by the Dutch East India Company, known by its Dutch initials VOC (Vereeningde Oost-Indische Company). In 1717, VOC shipped 907 kilogram coffee to Europe. Indonesia became the third place, outside of Arabia and Ethiopia, where coffee was widely cultivated (Neilson, 2012). By the mid of 1870s, VOC expanded Arabica coffee growing areas in Sumatra, Bali, Sulawesi and Timor islands. In North Sumatra highlands, coffee was first grown in 1888 and followed in Gayo Highland (Aceh) in 1924. In North Sumatra, coffee was first grown near Lake Toba. After Gayo, several area which become the central of Arabica coffee plantation was Lintong, Mandheling, Sidikalang and Brastagi.

In the late of 1800, Dutch colonialists established large Arabica coffee plantation in Eastern Java. Coffee rust disease (*Hemileia vastatrix*) destroyed the plantation which grown at lower latitude in 1876 and spread to other islands. To substitute the loss,

new variant of coffee or known as Robusta (*C. canephora* var. *robusta*) was introduced in 1900. The robusta coffee was planted in Kerinci and spread quickly in Sumatra during 1920s. Dutch owned plantation in Java Island was nationalized in 1950s after national independence. Right now most of plantation was managed by state-owned company namely Perusahaan Terbatas Perkebunan Nusantara (PTPN). PTPN revitalized the plantations by introducing new varieties of coffee Arabica. These varieties were adopted by smallholders through the government and various development programs. The result, according to International Coffee Organization (ICO), Indonesia was the fourth largest producer of coffee in the world in 2014 with an estimated production reached 540,000 metric tons in 2014.

A value chain is the process of creating value from the conception of a product through to its final consumption. It describes the full range of activities that are required to bring a product or service from conception, through the intermediary phases of production and delivery to final consumers, and final disposal after use (ILO, 2015). Value chain development for livelihoods and economic increasing focuses on value chains in which market demand is substantial and represented as entrepreneurs or employees. Interventions are then designed to strengthen the competitiveness of the value chain while expanding the share of value

added that reaches target groups. Such interventions connect micro and small enterprises to larger companies with access to wider markets, creating forward and backward linkages where farmers can participate.

Therefore, however the assessment is designed, it will need to incorporate micro-macro linkages, these being the linkages between issues that influence livelihoods and economic recovery at the individual, household, and community level (the micro level) and those issues that relate to the economy, policy framework, and systems of governance at provincial, national and, where relevant, regional levels (the macro level) (UNDP, 2013). In detail, the mapping and analysis will cover the market size, volume, distance, demand for and supply chain/competition, type of producers (large, medium, and small), existence of middle man, men and women led business/trades, available mode of transportation and market associations/trade organizations. It will also capture information about credit institutions, training providers, market associations, and enabling actors in the value chains of selected commodities.

The intervention developed, as follow up of the assessment; consist of vertical and horizontal aspects. Vertical value-chain interventions focus on strengthening dialogue between large enterprises that dominate the value chain and smaller enterprises in order to identify opportunities for increased participation in the value chain by small, local firms. Horizontal value-chain interventions focus on the access that smaller, less powerful businesses have to the business and financial services they require to participate more effectively in national and global value chains, as well as to the collective actions they can engage in through business associations and cooperatives.

## 2 METHOD

Method to meet the research objectives, this study used a mix of quantitative and qualitative methods. It employed strategies of inquiry that involve collecting data either simultaneously or sequentially to best understand research problems. The data collection involved gathering both numeric information as well as text information so that the final database represents both quantitative and qualitative informations (Creswell, 2003).

Purposive sampling methodology is selected for quantitative approach to focus on particular characteristics of a population that are of interest, which will best enable us to answer the research

questions. Considering that the projects has varied approach to achieve the same outcomes, maximum variation sampling techniques will be exercised to capture and to describe the central theme that cut across a great deal of participants or program variation. Any common patterns that emerge from great variation are of particular interest and value in capturing the core experience and central, shared aspects or impacts of a program (Patton, 1990).

The criteria being used to determine the respondents is designed together with the program owner and considered purposed theoretical approach that being used as the basis of this study. The criteria are: (i) covered 50 farmers interviewed in the sample area; (ii) 20% of the producer groups operational in current project; (iii) the respondent is listed as beneficiaries of the program; and (iv) the sampling will cover 30% of female respondents to get gender perspective of the program.

Qualitative approach emphasized on culturally specific information about the values, opinions, behaviors, and social contexts of particular populations and to identify intangible factors, such as social norms, socioeconomic status, gender roles, ethnicity, and religion, whose role in the research issue may not be readily apparent. The strength of qualitative research is its ability to provide complex textual descriptions of how people experience a given research issue. It provides information about the "human" side of an issue – that is, the often contradictory behaviors, beliefs, opinions, emotions, and relationships of individuals. Qualitative methods are also effective (Denzin et al., 2000).

The methodology being used to obtain qualitative data consist of:

- a. Document study consist of production and trades volume before and during the period of eruption; underlying policies, institutional and infrastructural issues that affect the competitiveness of the selected value chains; and the current planned investment and priorities of governments and development agencies in the sectors;
- b. Key informant interview participated by District Agriculture Office; District Cooperative, Industry and Trade Office; District Statistics Bureau; District Planning Agency; Key Distributors at village until district level; Pesticides Suppliers at district level, Farmers Group Leaders, and Community Leaders.
- c. Focus Group Discussion (FGD) involved farmers, local trader, and consumers.

The following data specific to 3 commodities were collected: a) Data on costs, production, sales

volumes, values and margins. b) Data on service providers, type of facilities and services they offer, terms and conditions of accessing such services, processing, marketing, constraints faced and opportunities available to the providers. c) Other value chain institutions like market information providers, input suppliers, and technology providers also provided data on nature of services, their target recipients, constraints and opportunities.

### 3 RESULT AND DISCUSSION

The History of Coffee Commodity in North Sumatra: Production of Coffee Commodities in Desa Horsik

The analysis of value chain mapping of coffee commodity in Desa Horsik is divided into four steps: mapping the main process of Value Chain; identifying the actors and the supporting institution in the Value Chain (VC); mapping the Value Chain distribution, and identify potentials problems and the solutions.

Based on the mapping process, there are 5 stages applied in VC for coffee commodity in Desa Horsik those are input providing; planting and harvesting; collecting; processing; distribution and trading. Mapping of value change of coffee commodity in desa horsik.

#### 3.1 Input and Supply of Coffee Commodity in Horsik Village

Seventy households (HH) live in Horsik village. Most of the villagers work as farmers. Compared with other commodity such as cocoa, coffee is the major product in these villages. In 2018, Horsik Village produced 23.00 ton of coffee parchment. Coffee commodity supports the income generation of the villagers in this village. The cost for production cost is affordable since they just need to put expense in subsidized fertilizer. For production, the farmers is using their own capital because limited access to micro finance institutions such as bank and cooperation. There is a financial institution in Horsik Village which can give financial support for the farmers. Input and supply stage for coffee commodity consists of supplying seeds, fertilizer and pesticide. Farmers do not need to buy the seeds because it is already provided by nature. Hence, they never use certified seeds. In term of fertilizer, the association of farmer groups (Gapoktan) receives subsidized fertilizer from government regularly. The subsidized fertilizers are urea, KCL and SP. Only

few farmers use pesticide. They buy the pesticide from pesticides store in Parapat.

The farmers have limited knowledge on how to conduct Good Agricultural Practices (GAP) even though the government already regulated the standards since 2006. The reasons for the late implementation are the lack of number of agricultural field facilitator who could assist the farmers in day to day activity and the farmers have limited access to information about GAP. Gapoktan members who were involved in the trainings did not consistently apply and share the knowledge to other farmers. Meanwhile, Local District Agriculture Service has limited resources to monitor the impact of the training.

#### 3.2 Planting and Harvesting

Farmers in target area plant the coffee seeds within space of 2 x 2 meters. If they have 1000 m<sup>2</sup> means that they can plant for about 150 seeds. The fertilizing method is applied differently amongst farmers. Due to the high cost of fertilizer and the lack of knowledge in using organic fertilizer, farmers conduct fertilizing based on their financial condition. Most of them rely on government's subsidy through Gapoktan. Farmers start to harvest the coffee after 3-4 years planting period with major production of 4-5 months in a year. It takes 7-14 harvesting days for each month. Farmers can harvest their crops themselves in picking the right coffee cherry since they never been trained before; only based on field experience. However, since the farmers only focus on having quick process during harvesting, this concern has been abandoned.

When the coffee bean has been harvested, it should be cleaned using water and being fermented. It would be better done in the flowing water. However, farmers in Horsik Village using the method by soak the coffee in pails. After being cleaned, the coffee is processed for pulping. Pulping is a process to peel and take the coffee pit. It can be done manually or using a machine that bought in Parapat for IDR 500.000. After being peeled, the pits are dried and sorted. In sunny days, it takes 2 hours to dry the pits before sell them to the collectors in Parapat market.

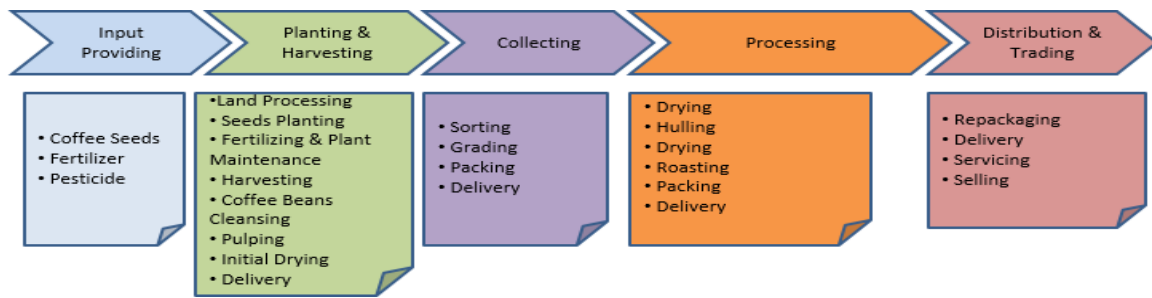


Figure 1. Map of Value Change Process for coffee commodity.

### 3.2.1 Collecting

The collecting stage happens when the collectors come to collect the coffee directly from the farmers in Toba Samosir District. There are only few collectors in Parapat Market. The well-known ones is Joko. These collectors sort the coffee pits based on the physical performance. If the coffee is physically good, collector will pay IDR 20,000 rupiahs per kilogram. In the other hand if it is not good, they will pay around IDR 18,000 per kilogram.

### 3.2.2 Processing

The processing stage is being done in Siborong-borong. This process is done by whole sellers, manufactures or cafes. The most well-known actors is Joko. The first step in processing stage is Huller process. This is a process when the green bean separated from its horn cover. Huller process produces green beans. They will be sorted manually by hand picking before they were sold to local market or being exported. The farmers usually ride motor cycle to transport the coffee to the collectors in Parapat. The commodity sells to local and international market. Every 2 weeks, the farmers take their coffee to the collectors. The coffee from this villages considered low and based on observation and discussion with local farmers, the reason for low quality is the hesitance of farmers to give fertilizer periodically. They only gives fertilizer once they have money to buy it.

Value chain stages role input and supply for production this stage involves the pesticides store that provide the farmers with information about pesticide products and spraying service; Agriculture Store in Parapat which provides fertilizer; and Gapoktan who managed subsidized fertilizer. Planting and Harvesting the VC actors in this stage are the farmers and the farmers focus on preparation of the field, maintenance and disease treatment and harvesting. Collecting the VC actors of this stage are

pooled/intermediate trader open a small shop in Parapat. Marketing and distribution the VC actors in this stage are supplier/grocery, exporter, distributor, retailer and coffee shop. Coffee bean suppliers are located in Medan, Sidikalang and Siborong-Borong. They are Joko, Sari Makmur, Ecom etc Supported institutions Agriculture District Office, Agriculture Extension Agency, Food Security Agency, micro finance institutions and Community Development Board.

### 3.2.3 Financial Analysis of Coffee Commodity

Value Chain mapping of coffee commodity assumes that the final product is roasted coffee. The actors are located in Siborong-borong. The roasted coffee price is IDR 59,000 per kilogram which the roasting process itself costed IDR 15,000. The price of roasting process is higher than the green bean in farmers/collectors levels. Roasting process is expensive since it determines the taste of the coffee that is why coffee from the same area can be different in taste.

Table 1: Economic Analysis of Green Bean (Primary Data, 2019)

Description	Parchment with moisture 40 %	Process/ kg	Green Bean with Moisture 13%
Price/kg	25.000		53.000
		Hulling	250
		Transport	1.000
		Worker	1.500
Yield		50 %	50.000
Margin/kg			750
Market	Collectors in Parapat Market		Sub importer

Table 2: Economic Analysis of Roasted Bean (Primary Data, 2019)

Process/kg	Coffee Premium Quality	Process/kg	Roasted and ground coffee	Process/Kg	Coffee with 70 gram/pack
	77.000		150.000		Rp 15.000/pack
worker	3.000	Roasted fee	35.000	Packs and label	26.000
Tools depreciation	500	Transport	2.000	Worker	5.000
		worker	2.000	Tools depreciation	2.000
		Packaging	5.000	Electricity	1.000
75 %	70.670	80 %	93.750		
	2.830		9.750		11.000
	roaster		Café		End consumer in Parapat, Samosir, Balige and others as tourism area

Cost production for farmers in input process is varied amongst farmers. They explain that the use of fertilizer and pesticide depends on their financial condition. For one kilogram of coffee, the farmers need to spend IDR 2.500 for the fertilizer. Based on this fact, farmers have limitation in coffee cultivation especially in the domain of product management and cultivating knowledge.

In average, the farmers get the margin about 34.73% - 37.27% with the price assumption of IDR 23,000 – IDR 24,500 per kilogram coffee. This margin is the second highest margin after the roaster one.

This margin is fair since they take a lot of process in the coffee production even though farmers in both villages have lack of knowledge in coffee production. Soil fertile gives advantage and simplifies the farming process as the plants can still grow with limited maintenance. Coffee collectors in Parapat got cost margin about 0.84% - 1.69 % or equal to IDR 500 – 1000 per kilogram coffee pits. In the peak season of harvest time (October-November), collectors get 40-50 ton per day of coffee pits. It means they get profit about IDR 40,000,000 – IDR 50,000,000 per day.

#### 4 CONCLUSIONS

1. Seedlings, no special seeds utilization by farmer mostly they put free on their own land.
2. Fertilizing, no pattern on fertilizer and pesticide utilization. Plant maintenance, lack of knowledge to maintain the crop has influence the harvesting. Post harvest, there is no peeling machine in the village that can be used by all farmers. The

farmers also had limited knowledge to maintain the machine. Coffee branding and packaging is not being done at farmers’ level. The farmers only sell dried coffee in which its price being determined by collectors in Parapat market after passed sorting steps. Cash flow management, most of the farmers do not know about cash flow management in coffee production.

3. Gapoktan capacity building. Gapoktan members not yet well organized in conducting their program. The group still focus on managing government support only.
4. Financial Institution, no financial institution at village level.
5. Pulping tool, the cost to provide this machine is high and none of the farmers has capacity to maintain it.
6. Household management, the ability manages income and expense still need to be increased so that farmers can set up better planning during cropping season.

#### REFERENCES

Asbjorn Eide (et.all), 1995, Economic, Social and Cultural Rights, A Textbook.  
 Chambers, R., 1994, Participatory Rural Appraisal: Challenges, Potentials and Paradigm, IDS, Brighton, UK.  
 Chambers, R & Conway, GR, 1991, Sustainable rural livelihoods: practical concepts for the 21st century, IDS Discussion Paper 296.  
 Cook, KE, 2008, “In-depth Interview” in LM Given, the Sage Encyclopedia of Qualitative Research Methods, Sage, London.

- Cornwal, et. al., 1995. What is Participatory Research; Elsevier Science Ltd.
- Creswell, 2003, Research Design: Qualitative, Quantitative, and Mixed Methods Approachs, Second Edition, University of Nebraska.
- Hennink, M.M. ,2007, International focus group research: A handbook for the health and social sciences. Cambridge University Press: Cambridge.
- Neilson, J. (2008). Regulasi swasta global dan restrukturisasi rantai nilai dalam sistem kopi petani kecil Indonesia, Pembangunan Dunia.
- Neilson, J. (2012). Kopi (Indonesia): 1900 hingga sekarang: Asia Timur dan Tenggara.
- Nutz and Sievers, 2015, A Rough Guide to Value Chain Development, ILO.
- Maskrey, A., Module on Community-based Disaster Risk Management, CBDRM-2 Handout, Bangkok, (1998);
- Mukherjee, A, 1995. Participatory Rural Appraisal; Methods and Application in Rural Planning, Vikas Publishing House PVT LTD.
- Patton, 1990, Qualitative Evaluation and Research Methods, Beverly Hills, CA: Sage.
- United Nation, United Nation Partnership for evelopment Framework 2011 – 2015 Indonesia
- UNDP, 2013, Livelihoods and Economic Recovery in Crisis Situations, New York.
- UNDP, 2012, Development of Inclusive Markets in Agriculture and Trade (DIMAT); An Assessment of the Beans Value Chain in Uganda.

