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Coffee in Indonesia: Experience from small-scale producers, North Sumatra

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Declaration

I hereby declare that I have written presented master thesis "Coffee in Indonesia: Experience from small-scale producers, North Sumatra" by myself with help of the literature listed in references.

April 25, 2013, Prague

Bc. Iva Nádvorníková

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Abstract

Coffee is a well-known commodity with an extensive value chain. Recently consumers started to explore the disproportion in money allocation. While farmers receive only minimal price for their product, gains go up to the top players. With-in the last years, number of initiatives and organizations promoting equitable distribution of income among these smallholders emerged.

Indonesia nowadays belongs to the top coffee producers with an increasing share on the global market. Particularly region of North Sumatra is region with unique coffee production such as Lintong and Mandheling coffee brands, that became more significant players at the world market.

Data were collected via semi-structured interviews with farmers during summer 2012, descriptive statistical analyses were used in order to examine small-holders´ role in the coffee value chain at North Sumatra and determine possibilities of farmers' empowerment appropriate due to local conditions and situation

For the local farmers, coffee cultivation showed the highest economic profitability and low amount of inputs. However, farmers are largely dependent on their capacities and do not receive much support from government authorities. This finding can explain why coffee is receiving such interest from the poor farmers. On the other hand, among the most cited cons of coffee production by farmers were usually poor-quality fertilizers supplies, low purchasing price and its fluctuation, and, poor access to credit. Also entry of new player into the market is changing the traditional coffee value chain towards the newly emerged global one when large multinational companies are entering local markets at North Sumatra. Opportunity in increasing farmers´ wellbeing is to specialize their production by meeting new regulations in certified and specialty coffee industry. This is a very suitable method for local farmers to reduce rural poverty and gain a higher profits due to the quality of their Arabica coffee production.

Key words:

Smallholders; trade; rural development; value chain; North Sumatra; Indonesia

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List of Abbreviations

AEK	Association of Indonesian Coffee Exporters
BPS	Badan Pusat Statistik
EUREP – GAP	Euro-Retailer Produce Working Group – Good Agriculture Practices
FAO	Food and Agricultural Organization
FAOSTAT	Food and Agriculture Organization of United Nations Statistics
FLO	Fair Trade Labeling Organization International
GNP	Gross National Product
ICA	International Coffee Agreement
ICO	International Coffee Organization
IDR	Indonesian Rupiah
IFAD	International Fund for Agriculture and Development
IFOAM	International Federation of Organic Agriculture Movement
IICD	Institute for International Cooperation and Development
IIED	International Institution of Environment and Development
IMF	International Monetary Fund
KUD	Kooperasi Unit Desa
LIFFE	London International Financial and Futures Exchange
NGO	Non-Governmental Organization
NYBOT	New York Board of Trade
SD	Sekolah Desar
SMA	Sekolah Menengda Atas
SMBR	Smithsonian Migratory Bird Centre
SMK	Sekolah Menengda Kejuruan
UNCTAD	United Nation Conference on Trade and Development
UNEP	United Nations Environment Program
US	United States
USAID	United States Agency for International Development
USD	United States Dollar
WB	World Bank
WCED	World Commission on Environment and Development
WTO	World Trade Organization

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1 Introduction

Coffee is a commodity well known to everyone around the world. Many of us cannot imagine their day without at least one cup. But the journey it has to make to get from the farmers to our table is more complicated and not so well known. Recently with the growth of the movements such as fair trade, consumers start to explore the value chains of commodities and significant disproportion in it. The farmers receive for their product just a minimal price and gains go up to the top players.

Indonesia is one of the biggest coffee exporters with an increasing share on the global market. Although this country got to this group of top producers recently, that does not mean it has not a long coffee planting history. Already in sixteenth century the Dutch colonialist brought the coffee to Java Island and from there it quickly spread to Sumatra Island (Clay, 2003).

North Sumatra is a unique place due to many natural, political and social specifications. There can be found two of the well-known coffee regions Lintong and Mandheling with increasing world demand.

Nowadays in the coffee value chain, more emphasis is put on smallholders producing the coffee and their livelihood. These farmers create the most important part of the coffee value chain–the product itself. Almost all of them depend on their revenue from the coffee production and often the whole family is involved in the coffee planting, harvesting and selling. The farmers at the North Tapanuli Regency, Batak ethnic group, named coffee Sigarar Utang, plant which pays the debts. It is recognized among them as a commodity with high value and importance. There are many methods how to acquire for the small-holders more share from the coffee value and at the same the meet the social, economic and environmental conditions. Numerous branding and specialty initiatives emerged during the last years. With specifying of the coffee production, farmers can get higher income and at the same time, nature will be preserved and the social condition will be met.

2 Literature Review

2.1 Introduction

Coffee is produced in about eighty tropical or subtropical countries. Over 10.6 million hectares are currently in coffee production (Rice, 2003). It is a primary export of many developing countries, and as many as 25 million people depend on coffee for their livelihood (Clay, 2003).

It is a tropical plant that grows between the latitudes of 25° N and 25° S but requires very specific environmental conditions for commercial cultivation. That includes temperature, rainfall, sunlight, wind, and soils specification, but requirements vary according to the varieties grown. Ideal average temperatures range between 15-24°C for Arabica and 24 - 30°C for Robusta and annual rainfall suitable for coffee is from 1,500 to 3,000 mm. The pattern of rainy and dry periods is important for growth, budding, and flowering. Whereas Robusta can be grown between sea level and about 800 m, Arabica does best at higher (Hicks, 2001).

Figure 1: Coffee cherries from green to ripe and diagram showing parts of the cherry (Winston, 2005)

Coffee matures about three years after planting. Each mature tree produces approximately 4,000 beans per year. This is the equivalent of half a kilogram of roasted coffee. While growing in full sun, coffee has a productive life of six to eight years and shade-grown coffee eighteen to twenty-four years. Coffee is a relatively easy crop to grow, but it is susceptible to a number of diseases and insect pests. At least 350 different diseases attack coffee, while more than 1,000 species of insects may cause the plant problems (Clay, 2003).

The two main coffee varieties are Arabica and Robusta. *Coffea Arabica* is grown in the tropical highlands and is mainly produced for its quality and superior flavor (Clay, 2003). The variety has about 2/3 of the market share and the largest producer is currently Colombia. *Coffea Canephora* (Robusta) is a high-yielding variety with good resistance to pests and diseases. With 1/3 of the world market, the main production of *Robusta* is Africa, Brazil and newly Vietnam (Sorby, 2002).

2.1.1 Harvest

The time of harvest varies but usually there is only one harvest per year. North of the equator, the harvest takes place between September and March. South of the equator, the harvest takes place in April and May, even until August. Countries on the equator are able to harvest fruit all year round. On an average coffee farm, the pickers may gather between 50 and 100 kg of coffee berries per day. Of this total weight only 20% is coffee bean (Hicks, 2001).

2.1.2 Processing

Within twenty-four hours of being picked, coffee should be processed to retain its overall quality. The first task is to remove the seeds from the fleshy fruit of the coffee cherry. This is done ether through wet or dry processing (Lyon, 2011).

In dry processing, the coffee cherries are dried by sun on a clean dry floor or on mats. The dried berry is then hulled to remove the pericarp. The hulled coffee is cleaned by winnowing (Arya and Rao, 2007). The amount of water used in dry processing is 1.4 to 14 liters per kilogram of processed coffee depending on the equipment. The main waste is the hulls themselves, which represent 50 percent of harvested weight, and parchment, the thin covering on the seed that represents 12 percent of the harvested weight. These materials can be used for fuel, organic matter for soil conditioning, fertilizer, or animal bedding (Clay, 2003).

Wet processing involves squeezing the berry in a pulping machine or pounding in a pestle and mortar to remove the outer fleshy material and leave the bean covered in mucilage. This mucilage is removed by fermentation. Fermentation involves placing the beans in plastic buckets or tanks and allowing them to sit, until the mucilage is broken down. The

coffee should be mixed occasionally and random beans should be tested. If the mucilage can be washed off, the beans are ready (Clifford and Willson, 1985).

After the first part of processing, the beans should be washed immediately as off flavors develop quickly. To prevent cracking the coffee beans should be dried slowly to 10% moisture content. The same drying methods can be used for wet as for the dry processed coffee. After drying the coffee should be rested for 8 hours in a well-ventilated place. The thin parchment around the coffee is removed either by hand, in a pestle and mortar or in a small huller (Mutua, 2000; Clay, 2003).

2.1.3 Roasting

The final flavor of the coffee is heavily dependent on how the beans are roasted. Roasting is a process in which coffee beans are heated to 170–240°C for a given length of time. It can be divided into free phases: a drying phase, a roasting phase and a cooling phase. The degree of roast is usually assessed visually and its preferences vary considerably from region to region (Clarke and Vitzthum, 2008).

2.2 Coffee history

The coffee plant was originally found and cultivated by the Oromo people in the Kafa province of Ethiopia, from which it received its name. Around 1000 A.D., Arab traders took coffee seeds home and started the first coffee plantations (Clay, 2003).

The Arabs were the first, not only to cultivate coffee but also to begin its trade. By the fifteenth century, coffee was grown in the Yemen district of Arabia and by the sixteenth century it was known in Persia, Egypt, Syria and Turkey (Weinberg and Bealer, 2002). Widespread popularity of the coffee was also due to the fact that Muslims, forbidden to drink alcohol by the Koran, found coffee to be an acceptable substitute.

The first known coffee shop was opened in Constantinople in 1475, and the idea quickly spread to other parts of Europe (Clay, 2003). For a time, Arabs controlled coffee production by not allowing access to coffee farms by outsiders, and by heating beans before export to prevent them from germinating. Seed beans and plant cuttings were eventually taken out of Arabia and cultivated in the Dutch colonies in India and Java (Crawford, 1852).

Coffee first arrived in Europe from Turkey via overland trade routes. Coffeehouses were already established in northern Europe with the sixteenth century arrival of cocoa, which then spread quickly as another coffeehouse drink (Clay, 2003). The growth of popular coffee houses, which became favorite meeting places for both social and business purposes, spread from the mid-17th century to other European countries including Austria, France, Germany, Holland and England and even to the colonies. At the time of Boston Tea Party coffee became very popular in America. Americans turned their back on Britain and tea and instead adopted coffee as their national beverage.

Since World War II, the coffee trade has become increasingly centralized. This has culminated with a few giant multinational corporations dominating world trade.

2.2.1 Coffee Crises

Prior to 1989, coffee prices were controlled by International Coffee Agreement (ICA). It imposed quotas and controlled prices between major coffee producing and consuming countries. This resulted in fairly stable prices for coffee between US$1 and $1.50 a pound. The ICA was renegotiated every five years by member countries. In 1989, the ICA collapsed when it was not renewed. Partly due to a lack of support by the US Reagan administrative, which was strongly free market oriented. Under the free market, prices plummeted down to $0.49 per pound in 1992 (Coffee & Conservation, 2006).

In the 1980s, when the economic clauses of the International Coffee Agreement were in effect, the final consumer spent around US$ 30 billion annually on coffee; of this total, exporting countries took US$ 9-10 billion annually, representing around 30-33 percent (Cardenas, 2001). In the early 1990s earnings by coffee producing countries were some US$ 10-12**.**

The loss of about 13 million bags of Brazilian production in 1994 pushed prices to a very high level in anticipation of a large deficit in the 1995-1996 seasons (Lewin et al., 2004). Supplies of coffee on the world market have typically run ahead of the growth in demand. Since domestic consumption in producing countries did not expand sufficiently to absorb growing supplies, coffee exports increased. But as developed country markets became increasingly saturated. Imbalance in the world coffee market and the consequent low prices

were exacerbated by new plantings in Viet Nam, and by an increase in Brazilian exports following expansion of plantings into frost-free areas (FAO, 2003a).

Other countries have also expanded production due to periods of profitable prices in the 1990s. Coffee production was no longer managed by producing country boards or by international agreements so that, although liberalization certainly increased producers exposure to market price volatility (Lewin et al., 2004).
The price paid to the farmers for their coffee, for both Robusta and Arabica, has fallen very low. In 1997 it started on the steep decline, hitting a 30-year low at the end of 2001. The real price of coffee beans has fallen dramatically down, just 25 per cent of its level in 1960, meaning that the money that farmers make from coffee can only buy one-quarter of what it could be 40 years ago (Gresser and Tickell, 2002).

The coffee crisis results not only from the price fall but also from the economic importance of coffee in many producing countries. Economic and social impacts have become generalized with declining incomes, increasing unemployment and increasing rural poverty across all producing countries and all production systems (Hallam, 2004). The drying up of coffee cash in the local economy is one of the main reasons for collapse of several banks. In Central America, these countries have revenue from coffee exports fall 44 per cent in one year alone. In sub-Saharan Africa, the same story prevails (Gresser and Tickell, 2002).

2.4 Trade with coffee

Coffee is the world's most popular beverage after water and accounts for exports worth about 7.4 million metric tons of green, or unroasted, coffee. The value-added coffee industry is worth about US$ 60 billion worldwide (Clay, 2003), traded in nearly 60 countries and classified as the top cash crops in developing countries' economies and crucial for some countries (Wahyudi and Jati, 2012). Total world coffee consumption is over six million tons per annum with Europe as the largest market, followed by the US and Japan (FAO, 2003b).

Daviron and Ponte (2005) stayed that most international trade consists of green coffee shipped in 60kg bags and, to a small extent, bulk instant coffee. Imported bulk instant

coffee is usually blended and re-packed in consuming countries. The roasted coffee trade is almost always between consuming countries (Chanakya and Alwis, 2004).

Essentially, two sets of prices are available for coffee according to Daviron and Ponte (2005):

- the ICO published prices which are indicators of physical trade, and where each contract refers to a specific quality, origin, shipment, currency and destination
- prices determined by futures markets, which reflect underlying market fundamentals (production, consumption and stocks) and technical trading factors (hedging, trends etc.)

Green coffee is available to buyers either directly from origin or via spot markets in the USA and Europe, and the dominant trade paradigm for the coffee industry is pricing based on two commodity exchanges: the New York Board of Trade (NYBOT), and the London International Financial and Futures Exchange (LIFFE), in London (FAO, 2013).

2.5 Value chain in coffee industry

Like many tropical agro-commodities, coffee is characterized by Southern production and Northern consumption and thus constitutes a main link connecting less developed countries to global markets. Coffee is grown in more than 60 developing countries worldwide by around 25 million farmers, the majority of which are smallholders using less than five hectares of land (Gresser and Tickell, 2002).

The concept of the value chain describes more than a set of input-output relationships. Kaplinsky (2004) stayed that it identifies key actors who play a critical role in coordinating production in the chain and defining who will be playing what role, what standards have to be met in participating in the chain, coordinating a process of upgrading the chain, and influencing the distribution of returns amongst the various players who participate in these chains.

In the general market chain for coffee Clay (2003) include on-farm growing, harvesting, primary processing and sorting, export, shipping, distribution, roasting, packaging, redistribution to retail stores, purchase by the consumer, brewing and drinking. The actual

number of players can vary considerably within the market chain as one entity can often fill a number of the different functions.

The simplest case in when farmers sell (often via cooperatives or local buyers) either to independent exporter or to exporters owned or controlled by multinational exporters. Roasters sell directly to retailers (supermarkets and bars or restaurants). The retail product may ether be in the form of roaster coffee or as soluble (instant) coffee (Gilbert, 2007).

Gresser and Tickell (2002) wrote that after the ICA regime collapsed, the power balance in the global coffee chain changed distinctly: on the one hand, the liberalization of agricultural markets in producing countries led to a decline in government intervention in the export and marketing processes; on the other hand, the end of the ICA resulted in buyer driven coffee chain with international traders, retailers but most of all roasters emerging as the powerful agents in the chain.

The intensified concentration of power also affected the value added and income distribution along the chain. While in the 1980s the proportion retained in coffee consuming countries oscillated around 51% and coffee growers received 20% of the total coffee income, this proportion altered to 78% versus 13% in favor of the consuming countries (Talbot and Walker, 2007).

Most notably since the end of the International Coffee Agreement, the terms of trade for coffee have declined significantly, while worldwide production has increased substantially, resulting in a chronic situation of oversupply and a major coffee crisis at the beginning of the millennium (Bitzer et al, 2008).

Gilbert (2007) stated that it is undeniable that the majority of smallholder coffee farmer have not obtained satisfactory returns over much of the past 15 years, while the roaster have enjoyed much greater prosperity.

2.6 Sustainability in coffee chain

In coffee production, matters of social justice are complicated by the heterogeneous structure of production. Coffee is produced by both large estates, whose owners typically are not in the poorest segments of society, and small-scale farmers (Valkila and Nygren,

2010; Wilson, 2010). Although producer organizations can provide an important revenue for democratic, equitable representation and infrastructure development, the relative isolation of many small coffee farmers often places prohibitively high transaction costs on effective participation in such organizations (Valkila et al., 2010).

Sustainable agriculture involves the successful management of resources for agriculture to satisfy changing human needs, while maintaining or enhancing the quality of the environment and conserving natural resources (Dumanski, et al, 1998). The critical issues, however, is to decide which interventions give the best short-term benefits, but also are sustainable over the long term.

One of the first definitions of sustainability offers the Brundtland Report (Brundtland and WCED, 1987): Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own. Recently, the definition has been expanded to include the ideas of fairness and interdependence, not only between generations but also between the countries and peoples on the globe (Brown et al., 1997). Social, cultural, economic and natural environments, whose harmonious development is essentials to the welfare of humanity and nature, are also included in the concept of sustainable development (Reed, 2007; Elkington, 2006).

It includes economic and social condition of producers, such as inadequate agricultural services and market development, lack of alternate rural employment opportunities, and pervasive rural poverty. Achieving sustainability is often much easier in the high potential areas than those with multiple physical and biological constraints. In most cases, agriculture services are better in these areas and attracting more investment (Dumanski et al., 1998). Whether the resource base is of high or low potential, inappropriate land and crop management ultimately results in a progressive degradation of the production base, continued poor performance of the rural economies and social systems, and perpetuation of the poverty spiral (Dumanski et al., 1998).

Goal should be to evolve sustainable systems in which appropriate technological and policy interventions that are well suited to local socio-economic and physical conditions and are supported by affordable and reliable policies and support services. However, these systems cannot be static systems, but must be carefully designed to be flexible and responsive to change, i.e. systems in transition (Dumanski et al, 2008). This will not be the

agriculture of today or of the recent past, with an emphasis on maximizing yields and economic returns, but rather one with the objectives of optimizing productivity and conserving the natural resource base (Altieri, 2000).

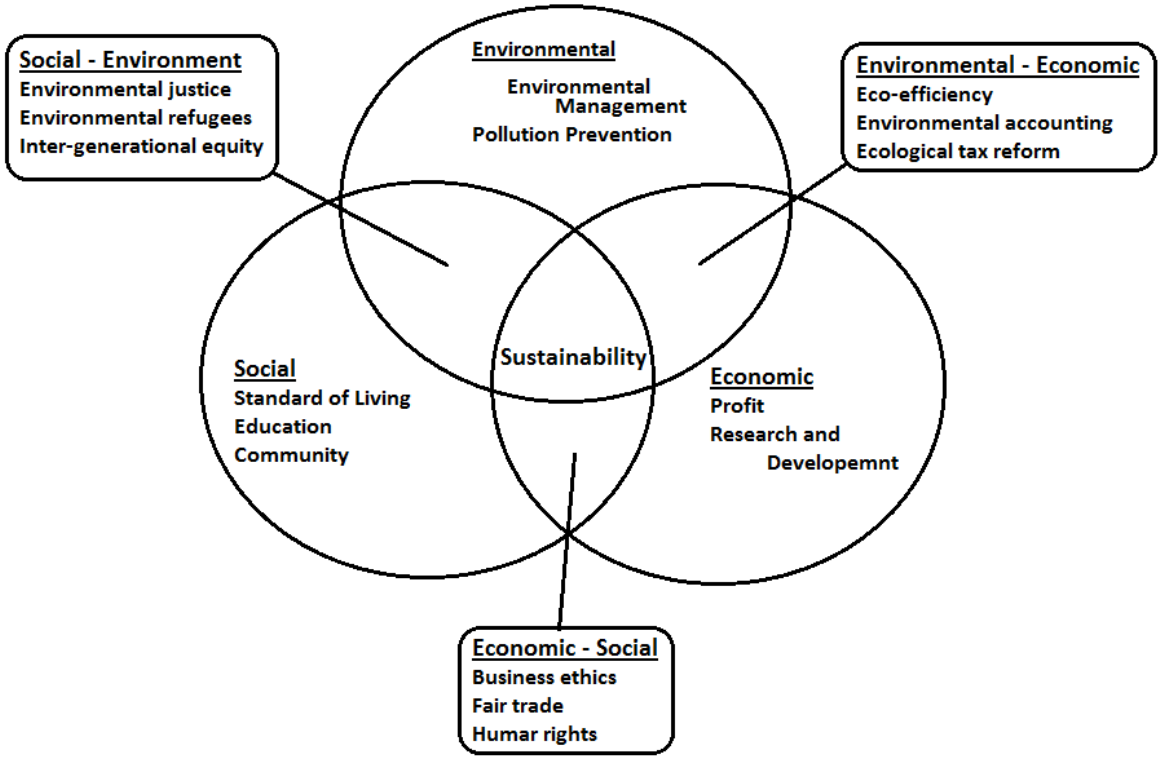

Figure 2: Sustainability model
Source: Based on Rodriguez et al., 2002

2.6.1 Environmental impacts of coffee

In-between the main environmental constraints of coffee production include habitat conversion, soil degradation, pesticide use, and water quality degradation. The most serious impact of coffee cultivation continues to be the conversion of natural forest areas to plant coffee (Rappole and Rivera, 2003). Increasingly, it is full-sun coffee that is being established in plantations. Full-sun coffee is also referred to as technician, high-input coffee production.

This form of coffee production results in increased solar radiation, and reduced nutrient cycling (Lin, 2007). It also results in a spiraling dependence on agrochemicals such as herbicides, fungicides and fertilizers.

Ways how to reduce environmental damage are diversifying production and sources of income and reduction of inputs and water use (Repetto, 1987).

This can also best practice to protect the incomes and viability of coffee producers. If this is the case, then there is a need to focus on integrating high-value crops such as vegetables and fruits that can be interplant with higher-value Arabica coffee (Clay, 2003).

2.7 Coffee smallholders

Coffee plantations cover approximately 10.6 million ha of land, mostly in the tropics and its production supports the livelihood of 4 million small-holder farmers in the world (Castro–Tanzi et. al, 2012). For the small farmers, accounting for approximately 70% of coffee production, declining prices of coffee have a direct impact on overall household revenues and access to basic needs (Valkila et al., 2010).

One of the main economic problems among the coffee smallholders is seasonality in production requiring investments prior to harvest and revenue returns. Small farmers with a low capital and savings base frequently rely on advances and credit to supply requisite pre - harvest inputs and living expenses. Although local buyers fulfill an important role through such credit provision, poor infrastructure development and anti-competitive practices regularly result in a profit transfer to numerous agents and middlemen, placing still greater financial pressures on producers (Valkila et al., 2010).

2.8 Coffee certification

In the former age of national capitalism, the achievement of market fairness was embedded in a normative framework generated by government, labor unions or religion authority. In the current age of global capitalism, new actors such as NGOs, industry associations and public-private partnerships provide the normative framework that corporations use for social legitimacy (Giovannucci and Ponte, 2005). Standard-setting processes operate as new forms of social contract where the state, rather than being directly involved between the parties, provides a form of basic guarantee while NGOs and firms are in charge of hammering out the bargains. As the boundaries between public and private good are becoming blurred, the challenge of maintaining equity and transparency lies in the balance of power between corporations and civil society groups, and in their increasing willingness for their mutual cooperation (Muradian and Pelupessy 2005).

Small coffee producers struggle to secure satisfactory economic returns on a volatile world market, where climatic events and few large companies influence prices significantly (Ponte, 2004). Due to the declining trend in coffee prices in recent decades, caused by the collapse of the International Coffee Agreement (ICA) and its production quotas, it was necessary to increase productivity through high-yield coffee varieties, higher intensity farming and mechanization of production, as well as improved roasting techniques (Ponte, 2002).

There is growing interest of international markets in differentiated agricultural products from the tropics. Coffee is a relatively high quality crop, with increasing value as demand in developed countries grows (Läderach et al., 2001). Bosselmann et al. (2009) also suggest to farmers increasing their market shares and reducing their vulnerability to fluctuating prices via certification. Farmers have to focus on increasing or maintaining coffee quality, while adopting specific environmental practices to fight against degradation (Castro-Tanzi et al., 2012).

2.8.1 History of certifying

Intersectional partnerships have experienced considerable growth over the last decade (Bitzer et al., 2008). In its early years, alternative trade represented a commodity chain parallel to the conventional market channels. Products from Southern countries have been sold in Northern cities, at prices above those of commercial brands, in special stores managed by NGOs and staffed by volunteers. Their consumers were convinced of the market's inequities and viewed their support as a political gesture (Renard, 2005).

In order to increase sales volumes and in response to a request from a coffee growers association in Mexico, the members of a Dutch association sought to introduce coffee from Southern cooperatives into their country's markets (Renard, 1999) so model of quality label, fair-trade, emerged. The label guaranteed to consumers that the product was sold under equitable conditions, with guarantee of quality, ethical values, justice, solidarity and opposition to the dominant relations within the conventional market (Renard, 1999). The label contains information about producers, establishing a relationship between Northern consumers and Southern producers who are usually invisible in the market (Watts and Goodman, 1997).

2.8.2 Specialty coffee

Within the specialty industry, there is a growing recognition and increasing market value for sustainable coffee. In-between the most important third-party certification schemes in the coffee sector belongs Fair Trade, Organic, Utz Certified, Shade-Grown, Rainforest Alliance and Bird Friendly (Valkila and Nygren, 2010). Others are sold under sustainability initiatives that are designed by private companies, with or without third party monitoring, i.e. Green Mountain Coffee Roasters' Stewardship Program; Thanksgiving Coffee Company's Song Bird and Bat Magic coffees; Starbucks' preferred supplier system, Rapunzel Pure Organics', E-Blend and E-Espresso (Ponte, 2004). Increasing number of the largest coffee industry players, like Nestlé and Kraft, are adopting sustainability standards. For example Starbucks, Procter and Gamble, Kraft and Ahold are already purchasing the sustainable coffee to meet their social responsibility conditions (Giovannucci and Ponte, 2005).

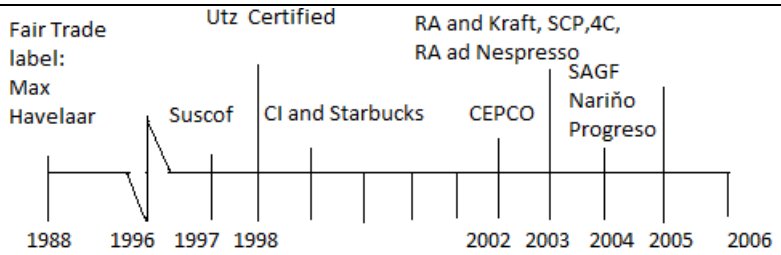

Figure 3: Start dates of partnership
Source: Based on Bitzer et al. (2008)

2.8.3 Fair Trade

Fair Trade is defined as an alternative approach to conventional trade that aims to improve the livelihoods and well-being of small producers by improving their market access, paying them a fair price with a fixed minimum and providing assurance of continuity in trading relationships (Giovannucci and Koekoek, 2003). In the coffee sector it has been pioneered by the Max Havelaar Foundation in the Netherlands in the late 1980s with the establishment of Fair Trade labeling. These national-level initiatives issue Fair Trade labels to importers and verify that Fair Trade standards are met and promote Far Trade products to retailers and consumers (Tallontire, 2000).

Group of coffee producers (cooperative, farmer association) can be registered to FLO if (i) its members are smallholders; (ii) the group is democratically run and politically

independent. FLO guidelines also require minimal use of agro-chemicals and environmental protection (Giovannucci and Koekoek, 2003).

Fair trade importers have to match a set of FLO standards (i) buy directly from the FLO-registered producer association on the long term bases; (ii) pay an FLO determined minimum price and a social premium to the producer organization; (iii) offer pre-financing for 60 % of the contract value upon request from the producer organization (Nicholls and Opal, 2005). They also provide technical support to producer organizations and play an advocacy role for producers in national and international fore. Farmer organizations use the fair trade premium for community projects, human resource development, environmental protection and business development. Part of the premium is also paid directly to farmers (Ponte, 2004).

A major difference between fair trade and other sustainability certifications is that fair trade attempts to address the power relations in trading, rather than putting the responsibility for matching a set of standards on the shoulders of producers, as often happens in other kinds of environmental and social certification (Bosselmann et al., 2009).

2.8.4 Organic

Organic coffee certification is based on a production management system that promotes and enhances natural soil activity and prohibits synthetically produced chemicals, depends on healthy crop through soil fertilization practices, such as recycling and composting (Giovannucci, 2005).

Organic standards are prepared by government authorities, international organizations and the International Federation of Organic Agriculture Movements (IFOAM). Accredited certification agencies monitor organic standards on production, processing and handling (Giovannucci and Koekoek, 2003). In general, a grower or processor of organic coffee may be certified by a public or private certification company if, among others, the following standards and procedures are met: (i) coffee is grown without the use of synthetic agro-chemicals for three years prior to certification; (ii) natural methods for controlling disease, pests, and weeds are used; (iii) farmers and processors keep detailed records of methods and materials used in coffee production and management plans; (iv) use of soil

conservation practices, including contour planting, terracing, planting cover crops, mulching, and planting shade trees (Ponte, 2004; Van der Vossen, 2005).

2.8.5 Shade-grown

Coffee can be grown under a variety of types of shade-from a monoculture shade system (with only one type of shade tree) to a multi-layered system with a high diversity of species. The second achieves a higher level of biodiversity than the monoculture. This creates a problem when shade grown coffee reaches the marketplace without third party certification, since the consumer does not know what level of shade is present on the farm (Philpott and Dietsch, 2003). Shade-grown is a relatively recent sustainable coffee certification initiative. Its main aim is to conserve forest cover through the production of coffee under the shade of forest. Currently, the only labels offering independent verification are the Smithsonian Migratory Bird Center (SMBC) for Bird-friendly coffee and the Rainforest Alliance for Rainforest Alliance certified coffee (Perfecto et al, 2005).

In traditional farming systems, coffee is part of an integrated agro-forestry system including indigenous tree species that provide shade and timber. It is also cropped with other food crops such as maize and bananas. This system supports the long-term sustainability of coffee yields and conserves water, soil and biodiversity (Giovannucci and Ponte, 2005; Ponte, 2004).

Sun coffee achieves higher yields in the short term due to higher coffee tree density and the application of external inputs. However, situation is different on the long-term sustainability of these gains (Perfecto et al., 2005). Clearing layers of vegetation decreases protection from soil erosion and water runoff (Ponte, 2002).

2.8.6 Smithsonian Bird-Friendly Coffee

Some shade-grown coffee is also known as bird-friendly. This is because it provides an eco-system for migratory birds and other forest wildlife (Ponte, 2004). The Smithsonian Migratory Bird Centre (SMBC) has developed a certification system for the production, processing and marketing of shade-grown organic coffee that awards a Bird-friendly label. Philpott and Dietsch (2003) certifies farms that are already certified as organic and follow as (i) the coffee plantation have at least forty per cent canopy cover; (ii) plant coverage has a high biodiversity; (iii) predominant species cannot occupy more than 60% of all shade trees.

Programs promoted by SMBC are using standards excluding large part of the farmers, excluding those with the most diverse commercial polyculture or rustic systems to ensure the high level of biodiversity (Mas and Dietsch, 2004).

2.8.7 Rainforest Alliance-Certified Coffee

The Rainforest Alliance tries to cover environmental, shade-specific and socio-economic issues, but its standards are less strict than in organic, SMBC's bird-friendly and fair trade certifications (Ponte, 2004), they combines environmental and social criteria. Coffee has to be grown under shade (although the shade criteria are less strict than in the Smithsonian certification). This requirement include at least 12 species of native trees that are well distributed around the farm, a density of shade trees species of 70 trees per ha and a minimum proportion of evergreen species (Muradian and Pelupessy, 2005). Use of agro-chemicals is kept to a minimum and strictly managed. Fair treatment and good conditions for workers must be provided. However, no minimum price is guaranteed and large farms can be certified, contrary to fair trade criteria. Growers must not burn fuel-wood and other waste wood from the pruning of coffee trees, and new farms cannot be established on cleared forestland (Adams and Ghaly, 2007).

2.8.8 Utz Kapeh

Utz Kapeh means a good cup of coffee in Mayan languages. This organization is a foundation originally set up with the support of the Dutch company Ahold, one of the world's largest retail chains. Now it is an independent initiative (Bacon, 2005). It has developed a code of conduct for growing sustainable coffee on the basis of the good agricultural practices of the European Retailer Group (EUREP-GAP). This code contains criteria on soil management, fertilizer use, integrated pest management, waste pollution management, worker health, safety and welfare, and other socio-economic and cultural aspects (Ponte, 2004). The organization sees itself as a partnership in-between the coffee producers, distributors and roasters to show their commitment to responsible coffee production in a credible, responsible, and market driven way. Utz Kapeh scope is limited to coffee production though it covers both hired labor and smallholder production types in Africa, Latin America and Asia (Bacon et al., 2008).

2.9 Indonesia

Indonesia is republic in South East Asia and Oceania, it is an archipelago comprising from more than 17,000 islands. Within 34 provinces are living over 238 million people (it is the world´s fourth most populous country). Since 2009, Indonesia has been classified as a lower middle-income country (FAO, 2011).

Across its many islands exist hundreds of native ethnic and linguistic groups. Largest group, and with the most economic and political power are Javanese, their shared identity has been defined by language and religion (with 85 percent of Moslem inhabitance is Indonesia the largest Moslem country in the world). Another significant ethnic group are the Bataks. They originated at North Sumatra and spread also to Java. Batak people have different language and also religion; they are mostly Christians (FAO, 2011, WB, 2013).

Prior to the crisis, Indonesia was one of the most rapidly growing economies in the world. In mid-1997 Indonesia was struck by a currency crisis, which by the first half of 1998 had already developed into a full blown economic and political crisis, exacerbated by a natural disaster (*El Nino* drought). During this period, the value of Indonesian currency, the rupiah, fell to as low as 15% of its pre-crisis value in less than one year, while the economy contracted by an unprecedented magnitude of 13.7 % in 1998, accompanied by skyrocketing domestic prices particularly those of food, inducing mass riots in the capital Jakarta and a few other cities, which culminated in the fall of the New Order government, which had been in power since mid-1960s (Suryahadi and Hadiwidjaja, 2011).

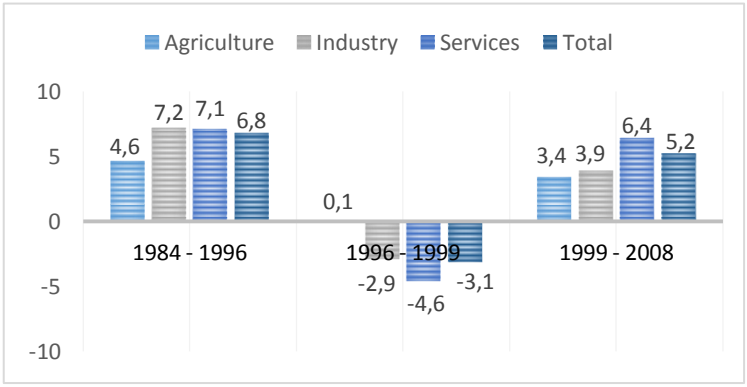

Figure 4: Sectorial Economic Growth in Indonesia 1984 - 2008 (% per year)
Source: BPS (various years)

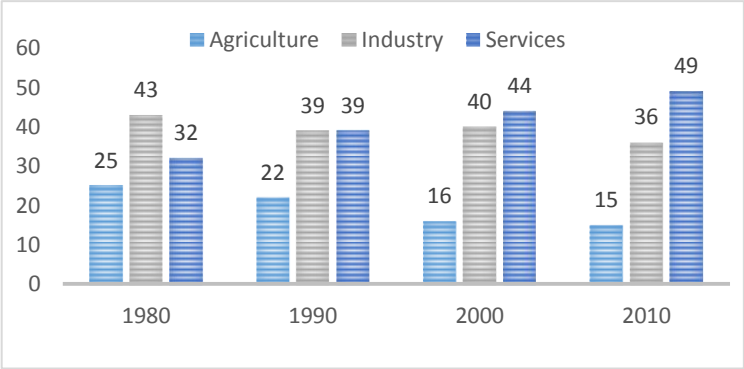

Figure 5: Sectorial GDP Share in Indonesia 1980 - 2010 (%)
Source: BPS (various years)

It is known as an agrarian country. Even with the downscaling tendency, agriculture is responsible for 15% of the country GDP and employs 40 % of the country inhabitances. Due to the abundant reserves of natural resources, 36 % of the country GDP is still represented by the industry, but the increasing share of the services (49% of the population) is very important phenomena in nowadays Indonesian development (BPS, 2013).

Table 1: Evolution of the Land Use in Indonesia (1996-2011)

	Area (Millions of ha)				Annual growth rate (%)		
	1996	2001	2006	2011	1996-2001	2001-2006	2006-2011
Total area	181.16	181.16	181.16	181.16	0,0	0,0	0,0
Arable land	17.94	20.20	21.50	23.50	4.1	4.6	2.9
Permanent crops	14.14	15.00	17.70	20.00	3.0	1.4	1.7
Forest cover	107.06	99.10	97.17	93.75	-1.5	-0.4	-0.7

Source: Based on FAOSTAT (2013)

However, large part of the rural population is living under the poverty line. From the 91 million people working in agriculture sector, more than 17 million of them are small holder farmers. 52% of the Indonesian poor are located in the agriculture (BPS, 2013).

Table 2: Evolution of Population and Labor Force Size in Indonesia (1997-2012)

	Size (Millions)				Annual growth rate (%)		
	1997	2002	2007	2012	1997-2002	2002-2007	2007-2012
Total population	205.06	219.03	232.46	244.77	1.2	4.1	4.1
Agricultural population	94.46	93.39	91.34	88.24	-0.2	-0.4	-0.7
Total labor force	92.41	103.53	113.79	123.34	4.1	3.3	2.3
Labor force in agriculture	46.52	48.52	49.43	49.44	0.9	0.4	0,0

Source: Based on FAOSTAT (2013)

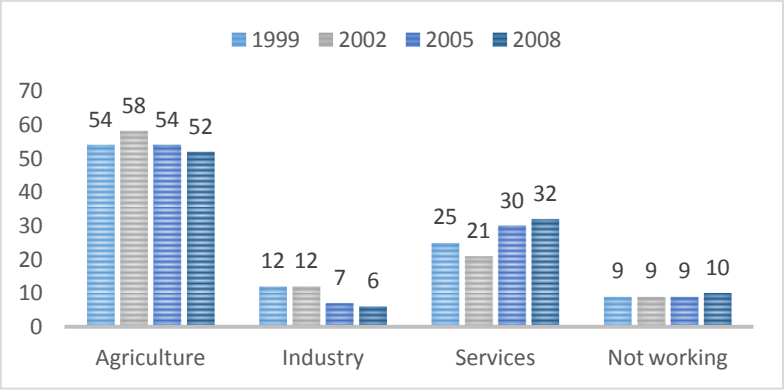

Figure 6: Sectorial Share of the Poor in Indonesia 1999 - 2008 (%)
Source: Based on BPS (various years)

2.9.1 Coffee in Indonesia

Indonesia exports 7% of world coffee production. Coffee represents 0.6% of total GNP and 17% of all agricultural products exports in Indonesia and in case of Arabica coffee deriving approximately US$ 1680.00/ year per hectare with 1.3 million hectares planted by coffee and average holding of 1.0 to 1.5 hectares (Ottoway, 2008). But there are still possibilities to grow for the farmers with the average yield relatively low, 500–800 kg/hectare/year. They state it is only 60% of potential production (Wahyudi and Jati, 2012).

Table 3: Area and production of coffee in Indonesia (1998-2011)

Year	Area (Ha)				Production (Tonnes)			
	Smallholders	Government	Private	Total	Smallholders	Government	Private	Total
1998	1,068,064	39,139	46,166	1,153,369	469,671	25,759	19,021	514,451
1999	1,059,245	39,316	28,716	1,127,277	493,94	26,208	11,539	531,687
2000	1,192,322	40,645	27,72	1,260,687	514,896	29,754	9,924	554,574
2001	1,258,628	26,954	27,801	1,313,383	541,476	18,111	9,647	569,234
2002	1,318,020	26,954	27,21	1,372,184	654,281	18,128	9,61	682,019
2003	1,240,222	26,597	25,091	1,291,910	644,657	17,007	9,591	671,255
2004	1,251,326	26,597	26,02	1,303,943	618,227	17,025	12,134	647,386
2005	1,202,392	26,641	26,239	1,255,272	615,556	17,034	7,775	640,365
2006	1,255,104	26,644	26,983	1,308,731	653,261	17,017	11,88	682,158
2007	1,243,429	23,721	28,761	1,295,911	652,336	13,642	10,498	676,476
2008	1,236,842	22,442	35,826	1,295,110	669,942	17,332	10,742	698,016
2009	1,217,506	22,794	25,935	1,266,235	653,918	14,387	14,285	682,59
2010	1,219,802	22,738	25,936	1,268,476	655,399	14,391	14,286	684,076
2011*	1,254,921	23,167	29,912	1,308,000	679,366	14,493	15,141	709,000

Source: Based on Kemertenian Pertanian Republik Indonesia (2013)
Note: * estimated data

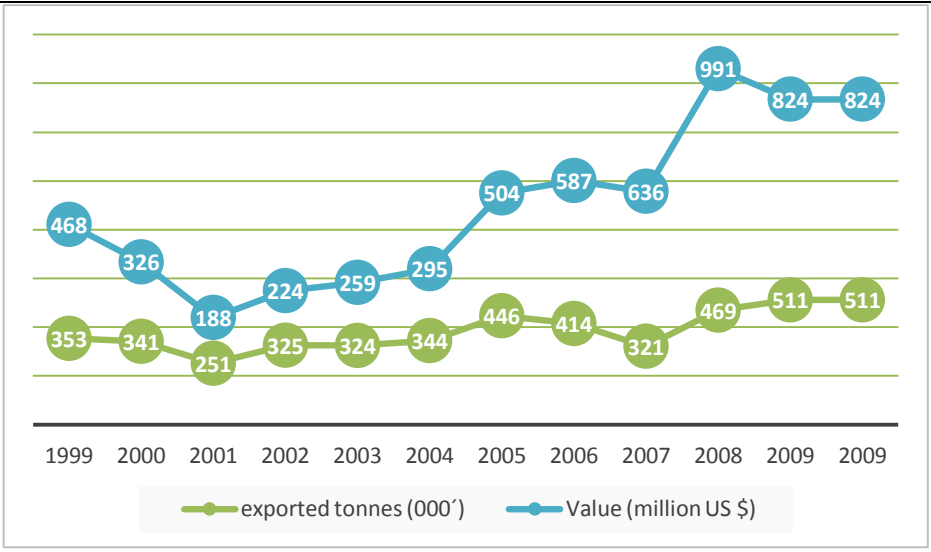

Figure 7: Coffee export – Indonesia
Resources: Based on FAOSTAT (2013)

3 Objectives

The aim of the thesis is to understand and analyze the situation of the small-holder farmers in the North Sumatra province and to examine their role in the coffee value chain. Farmers do not acquire the major share in the coffee value chain therefore their position in it is really vulnerable. By examining the power relation in-between the farmers and next level of local value chain various options of their empowerment will be determined. To reach these goals, farmers' livelihood in the local area will be examined. Specifically the production and processing of the coffee at the ground level in the study area is the key element to gain following information.

Specific objectives of the study are:

1) to understand and describe the role of the coffee in the life of the smallholder farmers in the North Sumatra and its impacts in poverty alleviation
2) to examine main farm and off farm activities of the farmers planting coffee, reveal hidden patterns
3) to trace the power relations in the local area, reveal the players at the market
4) to examine the possibilities for empowering the farmers appropriate due to the local conditions and situation
5) to suggest improvements of the local situation at the coffee market to ensure positive impact and sustainability in-between the coffee small-holders

4 Methodology

4.1 Background research

Before the actual research, a systematic literature review was performed using electronic databases of scientific papers and by studying bibliography in library. Sources of the secondary data were mostly Science Direct, Google Scholar and the websites of the Food and Agriculture Organization (FAO), World Bank (WB) and World Trade Organization (WTO). These data have created the background for the primary data collection in Indonesia.

4.2 Study area description

Study area is situated in the North Sumatra province. This is one of the most western provinces of the country, populated by almost 13 million inhabitants at the area of 74,000 km^2 (Statoids, 2013). It is the most populous Indonesian province outside Java. Through the Sumatra Island runs mountain range, dominated at North Sumatra by Lake Toba, in altitude of 1,500 meters above sea level, formed from the ancient volcano caldera.
The land is inhabited by the local ethnic Bataks. The term "Batak" designates any one of several groups inhabiting the interior of Sumatera Utara Province, south of Aceh: the Angkola, Karo, Mandailing, Pakpak, Simalungun, Toba, and others. The Batak number around 6 million and are mostly Christian, with some Muslim groups in the south and east (Kuipers, 2011).

Thanks to the high altitude and quality soil content, this area is very suitable for agriculture. Tropical climate predetermine dry and wet seasons during the year. Typical agriculture products in the region are paddy, peanuts, cassava, chili, ginger and corn. From the fruit commodities are common oranges, mandarins, bananas, pineapples and from plantation commodities mostly palm oil, rubber, cocoa, coconut and coffee. As a livestock, most of the households do have chickens and ducks. Due to the Christian majority in Batak areas, the traditional animal is also pig. Households focused on rice have also water buffalos.

North Sumatra is also the place, where Sumatra Mandheling and Sumatra Lintong coffee beans are produced. These two brands are recognized all over the world and especially in the United States is great demand after them.

Figure 8: Map of the study area North Sumatra

The research has been conducted in the area of Toba Samosir regency and North Tapanuli regency. Both regencies have together almost 6,900 km^2 and 583,000 inhabitants (Statoids, 2013). Agriculture represents the main activity and the source of income for more than half of the province population. In target areas, more than 80 % of labor force is involved in agricultural production.

Agriculture land is the true estate in North Sumatra. The price depends on the position and its quality, but generally, even few rante near to the main road (Transsumateran highway) is considered as a fortune. With the distance from the road, the roads are also getting worse, such as the price of the land. During the last 20 years, price of the agriculture land in North Sumatra is significantly increasing. Partly it is due to the overpopulation of Java Island, considered as one of the most fertile in the world. During these 20 years, the rest of

the world discovered North Sumatra as potential for Indonesian agriculture. Altitude and clime are pushing the current land price magnetically up.

Situation at North Sumatra, especially North Tapanuli regency regarding the coffee is different than in other parts of Indonesia. Near city Sipoholon is located repurchase center of company Starbucks. This company has slightly higher repurchase price for kg of coffee.

Farmers use mostly two methods for coffee planting – monoculture and polyculture. Polyculture has a long tradition among the farmers at North Sumatra. They are cropping the coffee with oranges, mandarins, ginger, chili and other crops. Mostly for the small holders it creates a way how to increase yields and diversify the production and biodiversity.

The roads are in very bad condition further from the main one. Households without sufficient transportation vehicle are not capable to transport greater amount of coffee to the market or to the factory.

Basic, compulsory education include primary (Sekolah Dasar - SD - six years. At upper secondary level which is not compulsory, there are general higher middle schools (Sekolah Menengah Atas - SMA) and vocational middle schools (Sekolah Menengah Kejuruan - SMK), both lasting three years (Speare and Harris, 1986). Than follows the university education.

4.3 Data collection

Prior to the data collection, participatory observation took place for three weeks, when potential variables for semi–structured surveys have been identified. After the participatory observation of the habits and daily life by using participatory extension techniques, local authorities have been interviewed. By understanding more into the details to historical strategies of coffee planting and as well present policy–driven mechanisms, the research could be conducted in more appropriate way.

According to gained information and comments, the variables for the semi–structured surveys have been enhanced and villages and farmers generating their livelihoods from coffee plantation have been identified. Based on the chosen variables, the survey has been created and consulted again with the local expert to ensure its containing all the necessary

aspects of the farmers' lifestyle, reflects the unique conditions of study area as natural conditions, ethnic and religious habits and traditions and other coffee related activities. The whole survey has been translated into Indonesian language by the team member, local student from university Polytechnic Informatica DEL. His valuable comment enriched the survey to the final level.

The farmers have been approached using the snowball methodology and information gained from the local authorities, 54 farmers planting coffee have been interviewed, using the semi–structured surveys, during the August 2012. Various questions have been focused on (i) identification of the household (information about the age distribution, gender composition, achieved education and other demographical aspects); (ii) farm and income specification; (iii) coffee related issues (cultivation, sales strategies, assets related to coffee).

After the collection, data have been cleaned and transferred into the data set and pre - coded. As the main statistical analyses has been applied descriptive statistic and correlation among the variables to examine relationships among them. The direct observation served as a control for the collected data and semi-standardized interviews with the coffee farmers.

For the purpose of the thesis, the dependent variable, family income[1] has been identified as the key factor for the wellbeing of the smallholders. Based on this assumption, correlations have been conducted comparing statistical dependence among other variables and the dependent one. Using the statistical program Gretl and SPSS, the most important explanatory variables have been identified and the results has been evaluated and described.

[1] Family income is sum of farm income and off–farm income. Farm income is all cash income from farm owned or rented by the household. Off–farm income is all cash income generated by the household from non–farm and non–agriculture activities.

5 Results

5.1 Household resources capacity and use

5.1.1 Land resources and use

Among the interviewed farmers, one household owns amount of land smaller than half hectare. This household also belonged to the group with lowest income and almost no additional one. Except this family, twelve households own land until one hectare. This land, in case if it is well cultivated, can feed whole family. For example, planting beneficial cash crop as chili or ginger can bring large amount of money. Third group is represented by farms owning in-between 1.1 and 1.5 hectares of agriculture land. The fourth group consists from fourteen households and possessing 1.6 to two hectares and from twelve farmers owing more than two hectares. Last group includes twelve farmers owing more than two hectares and consist from values reaching even to the level of four or five hectares.

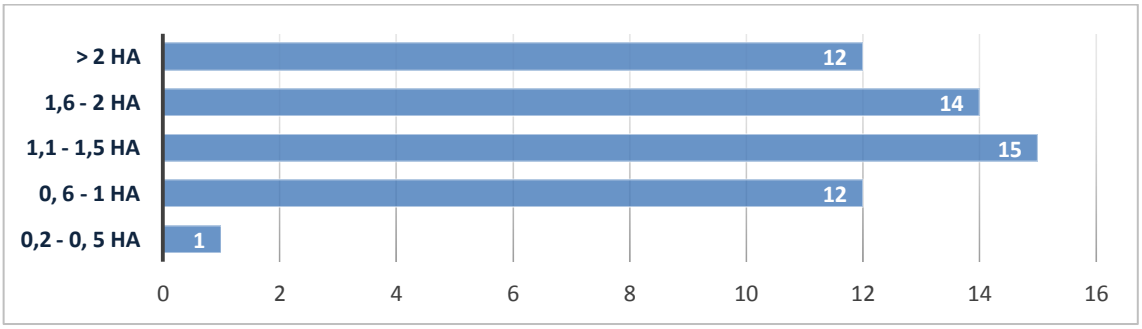

Figure 9: Farm size distribution in the study area

5.1.2 Human resources

Men play a leading role in decision-making process in the study area, with dominant role in farm management and cash expenditures. In contrary to this, women are responsible particularly for household activities and expenditures. Generally, out of total number of fifty-four interviewed persons, thirty nine were males and fourteen females.

From the four groups of age distribution, twenty-two farmers (41%) belong to the group with age from 40 to 55 year, followed by group of twenty farmers with age from 26 to 39 years (37%). Only four farmers are younger than 25 years and eight older 56 than years.

Figure 10: Gender and age distribution among the farmers

Household size usually ranges from four to seven members (56% of interviewed households). Nevertheless, larger families were also identified, seventeen farmers (31%) answered they are living in household with more than eight members including children. Number of household members with age under fifteen years is from 59% represented by families having less than three children. Opposite of them, six families (11% of the households), confirmed they have more than five children.

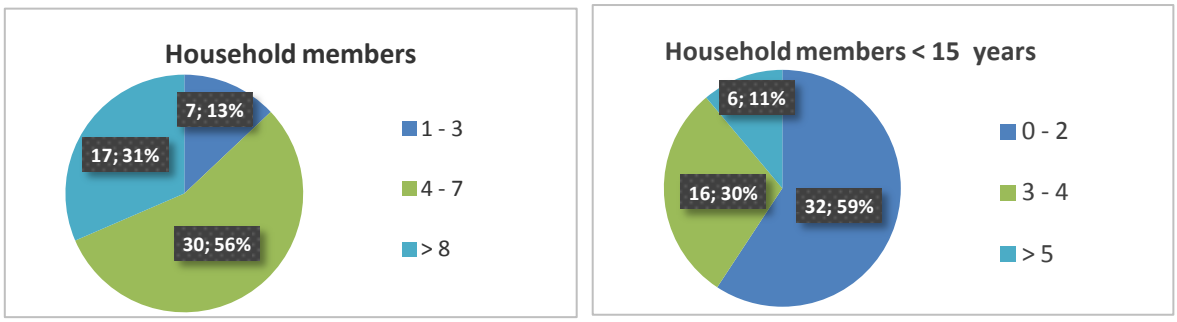

Figure 11: Household size and household age distribution in target area

Sumatra belongs to the less developed islands (compare to Java and Bali) but enrolment ratio among the farmers is still high. Only two heads of household stated they have never attended school, nine of them studied or were at least for couple of years enrolled at primary school SD, lasting six years. Higher level of education, general higher middle schools SMA, is already not compulsory and is represented by twenty seven farmers. SMK, lasting three years as SMA, has been translated as vocational middle school. Among the interviewed farmers, this group is represented by eight people. Quite extraordinary category among farmers is university education, both bachelor and master. University degree is still not common among the farmers.

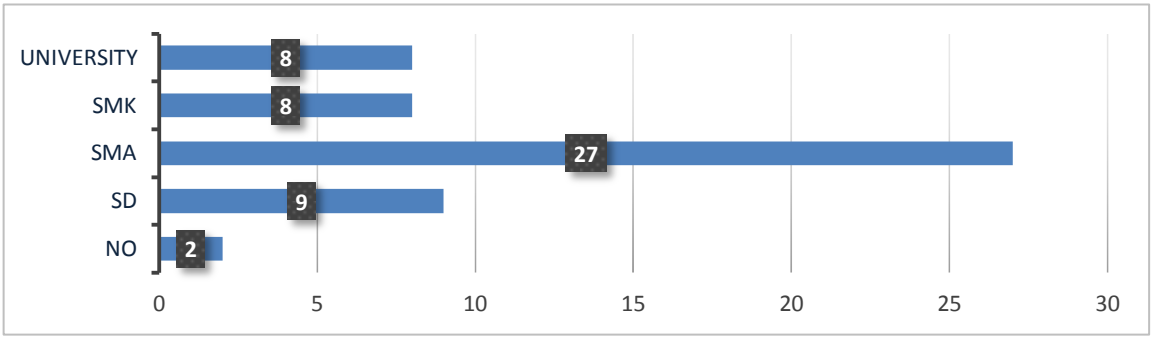

Figure 12: Education

Farmers sometimes hire additional seasonal workers. In the most cases it is maximally three days in a year. Mostly households with income above the average level hire extra labor to ease their coffee harvesting. In the case of large farms (above the three hectares) or insufficient members of household is extra labor necessary. Number of households using the extra labor most is six. These six farms have significantly larger coffee harvested area or the main focus of the farmer is another cash crops or activity. Sometimes even the household have farm for additional income and main source of their income comes from regular employment.

Daily salary for the seasonal worker in North Sumatra varies from 30 to 55,000 IDR. Average salary is around 45,000, but again in special areas people desire to work at the farm more than in other, together with that, the law of supply and demand determines the price.

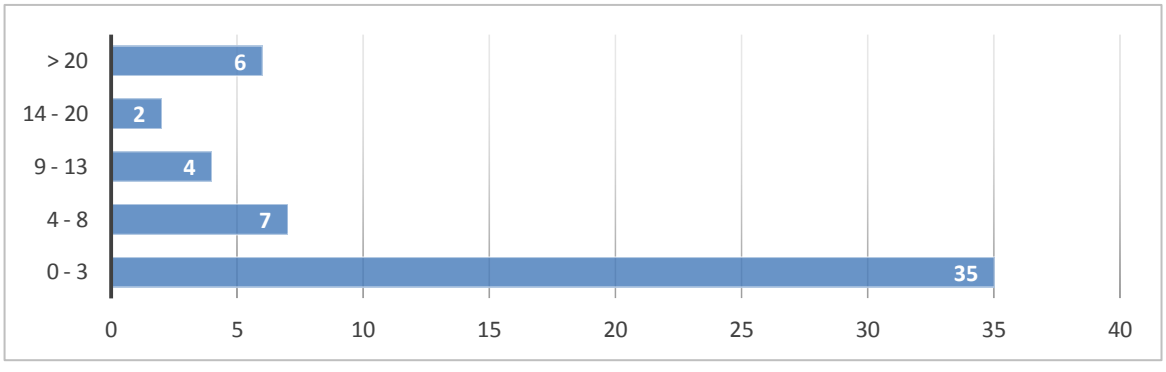

Figure 13: Seasonal workers (days/year)

5.2 Household economy

5.2.1 Family income

Based on our survey, ten households were identified as very poor (18.5%), seven as poor (13.0%), twenty-three as mediate (42.6%), and fourteen as better-off (25.9%). Both poor and very poor households are characterized particularly by low diversity of resources for income generation. On the other hand, mediate as well as better-off household diversify more their livelihood between farm and off-farm activities and their market orientation is also of higher importance.

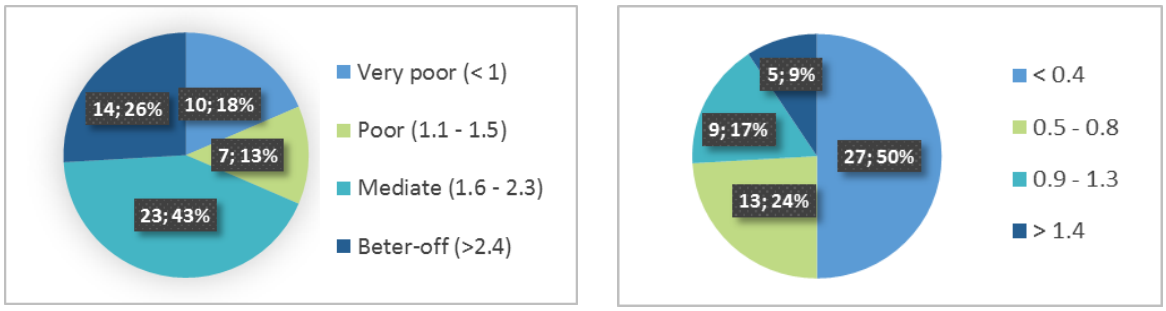

Figure 14: Family income and off-farm income groups (in Mio. IDR)

5.2.2 Credit

Credit is another important source of cash for the focuses households. Credits and debts is always a sensitive issue for farmers. Thus, only 14 of them proved they borrow money from bank or agent, but mostly from friend or relative. Prevailing purpose of these loans is agriculture development, followed by group of farmers using the money for the education. Just abundant number of farmers is using the money for other purposes.

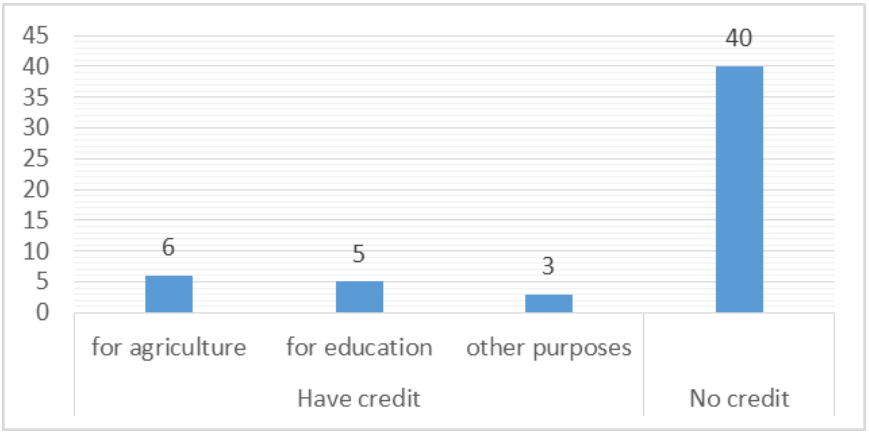

Figure 15: Credit distribution

5.2.3 *Cooperatives, social movement, social capital/security*

For farmers is very important membership in kolompok[2]. However, still satisfied members of kolompok are only 18 from 54. Due to local conditions there is also group of 10 kolompok members who are not satisfied with institution activities, but they still remain members. Therefore also 26 households are not members of any kolompok institution.

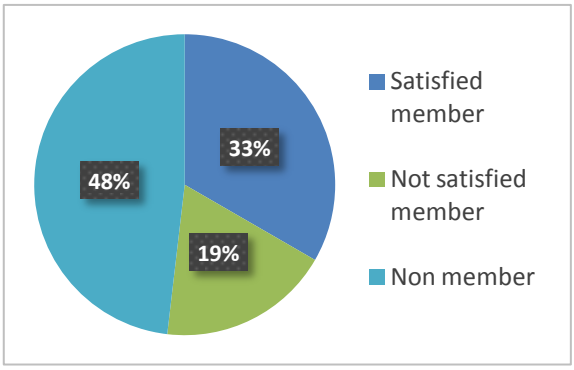

Figure 16: Satisfaction with membership in kolompok among our respondents

5.3 Impact of coffee production on household cash security

5.3.1 Role of coffee in land-use system

According to the figure 17, most of the farms area planted by coffee is less than 1 ha (24 households). In case of larger farms it ensure, that there is place for another crops to be cultivated, but 19 households (represent 35% of all interviewed farmers) have the same size of the whole cultivated land and area where they are planting coffee. But only thirteen of these nineteen dependent household are highly dependent on coffee. Other six of these 19 are cultivating coffee as polyculture with other crops, so besides the coffee, they are also planting another one. Even from these 13 highly dependent households, few of them also support the agriculture with animal production.

At the second graph is described by how many percent the household income is created by coffee. Even when many households' heads spoke in previous question about the insecurity and high dependent on coffee, only three farmers described their dependence

[2] Kolompok is an agrarian association of farmers. Members of kolompok are officially recognized by government and can receive agriculture donations or free pesticides. Sometimes the membership is also connected with membership fee, depending on each kolompok.

higher than 80%. In another following group, only ten farmers expressed their dependence. Following groups dependent less than 60% counted together forty-one farmers.

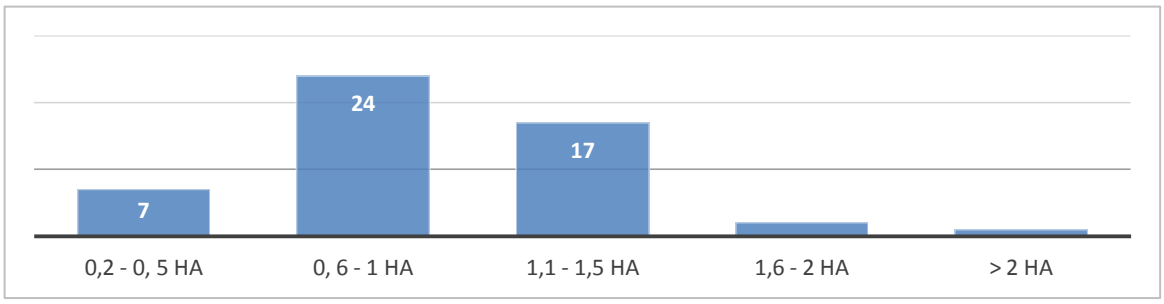

Figure 17: Area planted by coffee

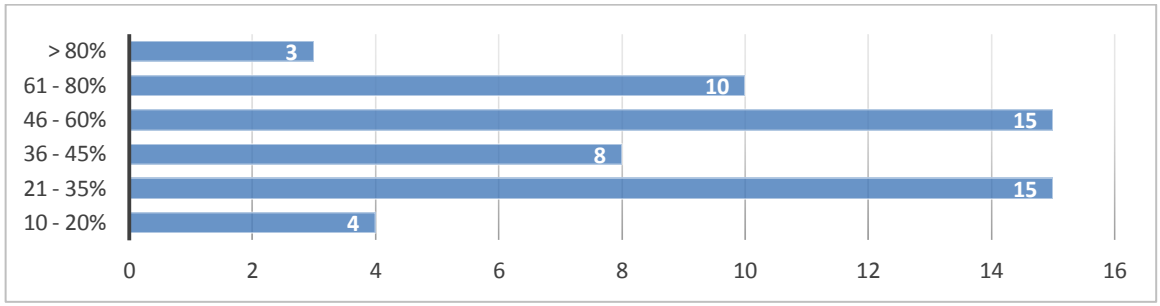

Figure 18: Per cent of household income created by coffee

5.3.2 Coffee production value chain development

Cash security and well-being among the coffee farmers depends also to whom they actually sell the coffee. The prices violate due to the stock market prices of coffee (during the research in July–August the prices were around 17,000 IDR per kg). Still the largest group of the farmers, twenty-eight, sells the coffee to the agents. These agents repurchase price vary in-between the lowest (two-times) and highest (six-times).

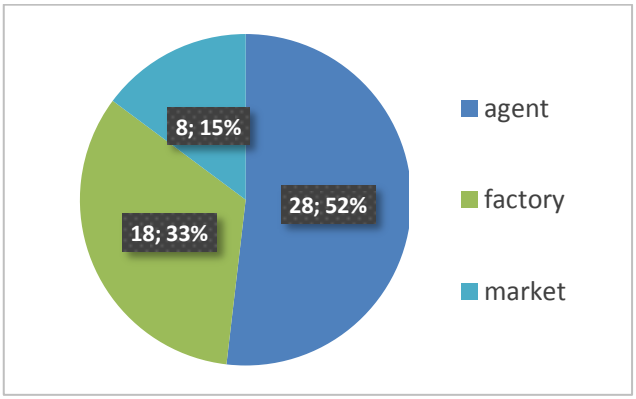

Figure 19. Farmers are selling coffee to (in ´000 IDR)

Price depends on the type of agent. One type of agent is trying to take advantage of lacking knowledge of farmer and by using many excuses is trying to beat the price to the lowest level. Four farmers said that agents justified their low price not just by quality of coffee. The agents literally said that such a low quality can be used only for the gunpowder production. Farmers generally believe to this information and agree on this business. Another group of farmers sells to the agent due to low quality of communications. Last significant group of farmers selling their coffee to agent are relatives of the agent or in another way the agent support the household with free credit. It is mostly often followed habit of locals. In that case coffee price is slightly lower than is factory (1,000–2,000 IDR/kg). In another case when the farmer owe to the agent money (so called loans), repurchasing price is in this case deep under the price level. The agent borrows money to the farmer and at the same time request low repurchasing prices. Farmer will promise anything with the money in his hand and next year, the circle continues.

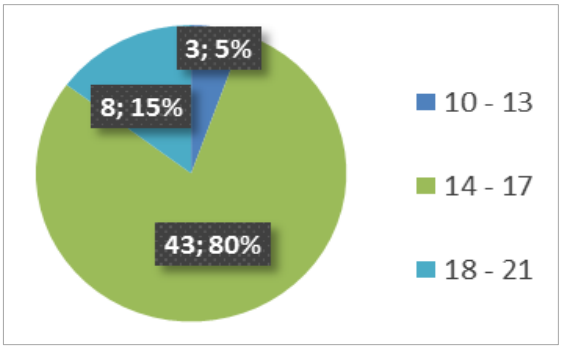

Figure 20: Repurchasing price of coffee (in ´000 IDR)

Quality of the coffee depends on many factors; one of them is the coffee age. In the next graph is shown how old are the coffee plants at North Sumatra. Most of the farmers do not remember the exact time when they have rehabilitated their plantation, but they answered the age they expected. The most common age of the coffee tree is around 11–15 years (twenty-seven farms). Also the group, where the coffee is less than ten years is represented by twenty farmers. This fact is due to the rehabilitation of the plantation in recent years.

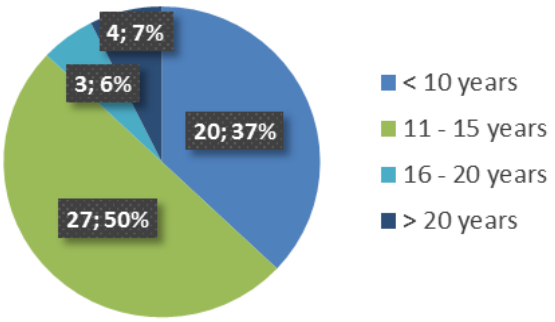

Figure 21: Age of coffee tree

In-between another aspects of the coffee quality belongs the skills of the farmer. Due to the interviews, only eleven farmers confirmed they have received education or extension in coffee. The rest of them, forty-three farmers answered they have not. Even when in the area numerous governmental extension agencies are working, they have not approached these farmers. Still, the farmers generally do not believe to the information received from the governmental officers. The new techniques and practices approach these regions very slowly. Farmers still using mostly the traditional techniques passed from one to other generation rather than to the new one. It is quite problematic try to convince the farmers starting to roast their own coffee by themselves (only two farmers from fifty-four do) and to sell the coffee for a better price or with better condition. Also the certification of the coffee, very popular among the coffee farmers in Latin America or Africa in not spread among the farmers at North Sumatra. Only six farmers have heard about the coffee certification (mostly Fair-trade). From these 6 farmers only one farmer had a coffee certification.

Use of the fertilizer is another quality aspect. Most of the farmers answered they are using the fertilizers at their farm, mostly the combination of organic and chemical one (thirty-five farmers), ten farmers using only organic fertilizers (mostly due to the fact that do not want to spend money on purchasing the chemical one), four farmers are using just the chemical fertilizers believing they are more efficient than the organic ones and five farmer answered they do not use any fertilizer at all.

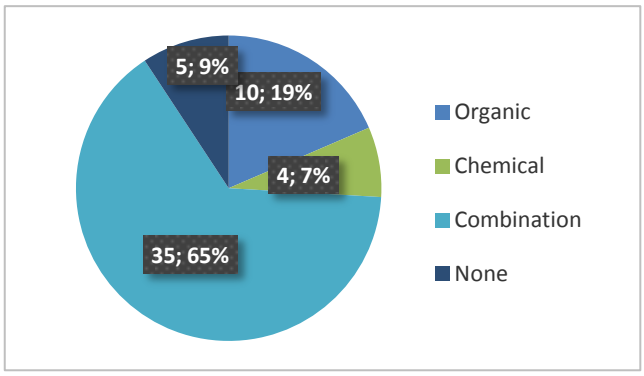

Figure 22: Fertilizer used

Farmers for coffee planting use mostly two methods, monoculture or polyculture. The poly–culture is more common, 30 farmers confirmed they are intercropping coffee with different plants, 24 using the mono–culture.

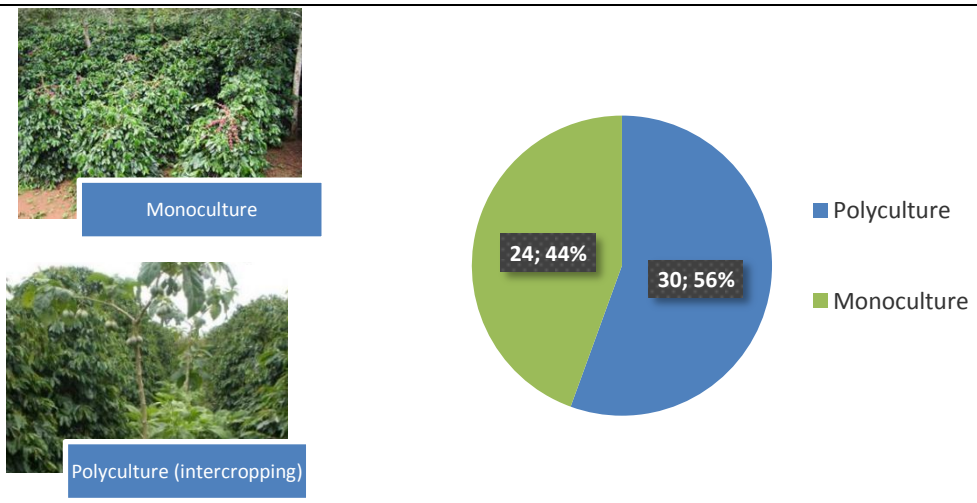

Figure 23: Coffee planting method

For the coffee processing farmers are mostly using the manual pulping machine (37 farmers). These pulping machines are made from wood. As the wheel, for the rotation, serves daily things (for example wheel from vehicle). There were also four farmers who answered they own an engine driven pulping machine; three farmers have even the higher mechanization as small tractor.

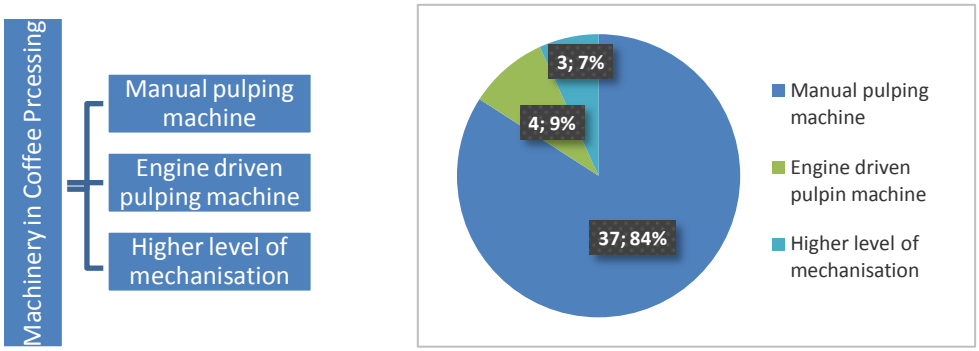

Figure 24: Level of machinery equipment

Due to the almost equatorial location of North Sumatra, farmers can harvest the coffee almost the whole year and many of do. Eight farmers answered they are going on the plantation every week and harvest the coffee, sixteen farmers have answered they have one big and three small harvests during the year. In this case, as the main season, is considered time from approximately March to May. Another large season is approximately from November to December. There are twenty farmers who harvest the coffee two times per year, exactly in these peak months. The rest, nine farmers, answered that they harvest the coffee just one time per whole year. These farmers have coffee just as additional income, so they are not dependent on the high yields as other farmers are.

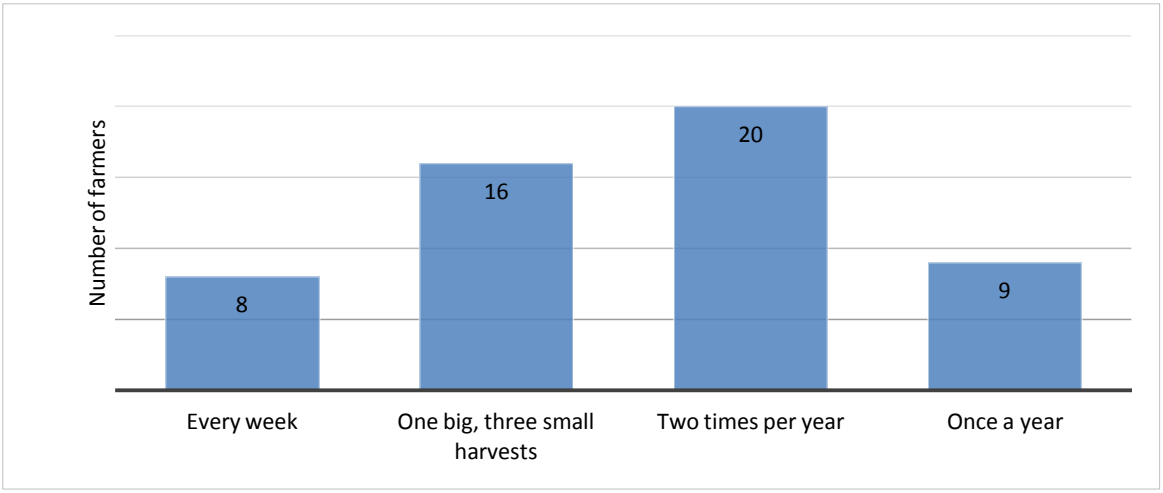

Figure 25: Harvest frequency

By interviewing the farmers, the procedures and players in the coffee industry at North Sumatra have been identified. Figure 26 display the relation among the various players and most common ways of coffee value chain in North Tapanuli regency. The way of the coffee into the international market is displayed as a value chain.

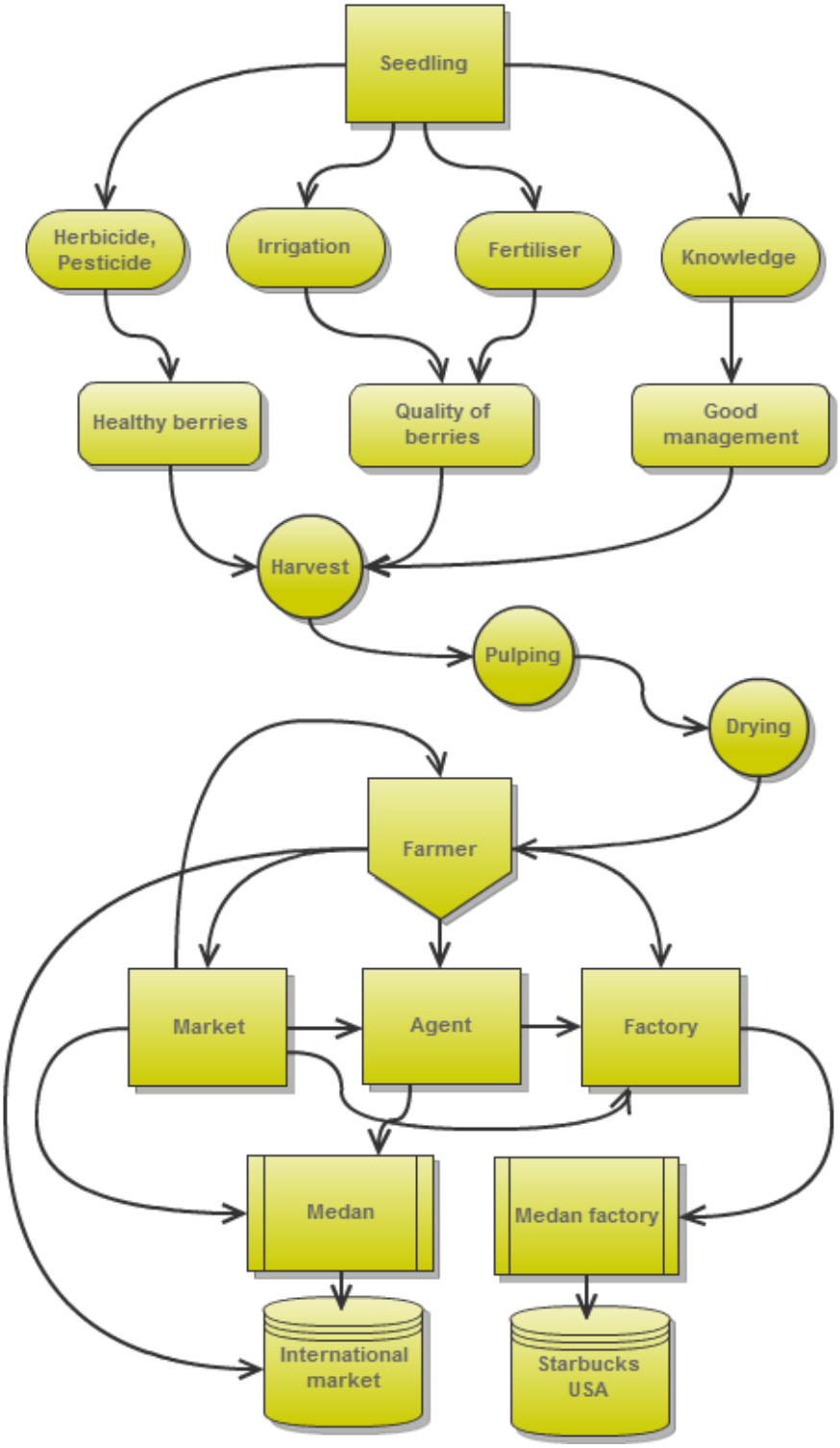

Figure 26: Coffee value chain

Numerous inputs are necessary to produce the green beans which are planted, harvested, pulped and dried by farmers itself. Farmer is approached by agent or sells the coffee to the Starbuck factory or with a lower quality coffee at a local market.

At the market, coffee is purchased by other than coffee farmers and sometimes coffee farmers to. In case they are planting high quality coffee, they sell it all to the factory or agent and for themselves they will buy cheaper and less quality coffee. In case of higher coffee quality, agent approaches the international market with coffee by himself or sells it at the main Sumatran market in Medan. Starbuck factory send the coffee to their special factory near Medan where the green beans are again dried and are prepared for the shipping to the US. If the coffee gets to the Medan market, there is purchased by international buyers.

5.4 SWOT Analyses

In the following table, the main benefits and disadvantages of planting coffee at North Sumatra are represented:

Table 4: SWOT analysis of coffee production at North Sumatra

Strengths	**Weaknesses**
• coffee quality • access to critical inputs • favorable agriculture condition • demand for their coffee	• absence of legal framework • farmers dependence on traditional procedures • small share in the profits • lacking knowledge • lacking motivation
Opportunities	**Threats**
• poverty alleviation • higher enrollment of the children • empowerment of the farmers • certificates – lifting towards environmentally and socially friendly production	• coffee price violation • corruption • lack of transparency and power relations • manipulation with the farmers • mass production–environmental degradation

5.5 Correlation

Among all the variables gained troughs research, the family income was chosen as a dependent one, representing farmer´s wellbeing. The correlation has been conducted among this dependent variable and twenty-eight independent variables which were also derived from the research data.

Table 5: Correlation among the variables

	Family income
Age	0,65
Education	0,45
Extra labor	0,44

$\alpha = 0.95$

From the outputs, the highest correlation in-between the Family income and independent variables were reached with the variable Age (65%). It means that the farmer with the higher education will obtain higher income with probability of 65%, but level 0.65 is still statistically not significant. High correlation levels with Family income have also variables Education (45%) and Extra labor (44%). By Extra labor is meant when the farmer hire someone out of the family and pay him wage. Farmers who rent an additional seasonal worker will have a higher income with probability of 44%. Again, this result is not statistically significant. The same is valid for the next variable Education. With 45% probability, the farmer with higher education will receive higher income. The farmers who are older (mostly with more experiences) and those who will accomplish higher educational level will have a higher family income than other.

6 Discussion

6.1 Land resources and use

Land is a valuable commodity at North Sumatra; research showed that average farm size is approximately 1.5 hectare. According to the Wahyudi and Jati (2012), total area of coffee production is 1.2 million hectares (96% are owned by smallholders) with average farm size of 0.6 hectare. Wahyudi and Jati (2012) point that farmers do not utilize the land properly, the average yield in the area is relatively low, 500–800 kg/hectare/year, it is only sixty percent of its potential. Farmers often lack the initiative to increase their livelihood level and even if they are not satisfied with the current situation, the constraints needed to obtain higher yields and needed for intensive agriculture approaches mean significant value for their decision making. For this instance, enlargement of their field is for them closer possibility than the intensification of their own production.

6.1.1 Natural resources

Tropical deforestation is commonly explained by the expansion of traditional agriculture, shifting cultivation (Angelsen, 1995). As Chomitz and Griffiths (1996) said, the agriculture expansion is the main factor for contributing to the forest clearance in Indonesia. Greater impact has an expansion of the cash tree crop as rubber, coconut, oil palm and coffee. In the case of North Sumatra, coffee is produced mostly by smallholders but rubber and oil palm are closely connected with the larger estates. A large part of these estates are rented to the foreigner companies (Tomich et al., 2001). Numerous studies suggest that the lobbying activities of special interest groups in many developing countries have played a significant role in influencing key government policies that determine land use decisions in these countries (Ascher, 1999; Hafner, 1998; Dove and Kammen). As argued by Ascher (1999) the result of such lobbying is that governments in turn will purposely create rent-seeking opportunities for those special interests that benefit from favorable land use policies: as a consequence, government corruption is now seen to be an overall problem dictating forest land use policies in developing countries (McCarthy, 2000). Small-scale farmers at research area mostly do not deal directly with these overall land issues due to the fact; they are not significant player in the global value chain with these products. But the results of these negotiations heavily influence their life.

6.2 Human resources

By involving total of 2.33 million households of smallholder farmers (Ottaway, 2007), coffee has a significant impact on the eradication of poverty among the rural population, especially at North Sumatra province. Wahyudi and Jati (2012) state that the number of coffee farmers is 1.97 million and by assuming 4 family members of each coffee farmer, the number of people dependent on the coffee production increase to 7.9 million people in Indonesia.

In case that the harvest is good, farmers hire their neighbors or distant relatives or just people living in rural areas for a few days in year to help mostly with the coffee harvesting. This additional labor is hired for a longer time or for a whole year just in the case that the farm is considerable well established.

For the coffee planting and harvesting is often responsible woman. Even as the official head of the household is considered man with also the main decision making and negotiating power, woman is the head of the household activities and also often works harder on the field. They are the non-formal heads of the household in many farm aspects until the time of coffee selling; this business is done mostly by men.
Batak family is patrilineal, in case of marriage, woman come to stay at her husband place. Until the marriage, it is common to stay at the parents' house and then move out with the husband.

In the long term, lot of young people gaining higher education desire to leave North Sumatra to reach the main cities, especially on Java Island as the capital Jakarta. Working in agriculture is not considered among many of the youngsters as desirable occupation. Due to this fact, many of them leaving their parents and they are left to manage the farm on their own until old age. Mostly they have to lead the farm due to the fact that their children moved out the region or they are still living with their children family and sustain the head of the farm.

6.3 Cash security

6.3.1 Family income

Ottaway (2007) stated that the income of the average coffee Arabica farmer is approximately $ 1680.00/ year per hectare which transferred into the Indonesian currency states for 1.4 million IDR/month. These numbers generally correspond with the data obtained through interviews with the farmers. These numbers are excluding the off-farm income gained thought the various diversifications of the agrarian production or by employment at someone else farm or in the different field.

Mostly among the mediate and better-off farmers is observed that they leverage their income in the different groups contain not just agriculture products, but also breeding of livelihoods and other activities as services. These groups are more sustainable in the long term period and in case of any shock or unexpected situation, their incomes will be maintained at an acceptable level. This is not the case of the poor and very poor households which depends mainly on a few commodities and their share of additional income is abundant. These families are exposed to the all harmful effects of the market situation and are at risk of falling below the poverty line.

Farmers can secure their income and improve it by another way. One of these possibilities is to specify their coffee production by various certifications and other methods promising higher cash security.

6.3.2 Credit

Even, that the credit is important source of the cash for the farmers, to admit that they did borrowed the money is quite sensitive issue. With less than twenty percent of the farmers admitting they have been borrowing additional money is probable that the number of actual borrowers is slightly higher.

The source of the credit is generally the agent purchasing the coffee from the farmer. According to the Neilson et al., (2008) the role of the first-stage collector in the network is particularly important. They frequently offer a line of credit to farmers in return for exclusive or favorable sale of the coffee to the agent, interlinking product marketing and credit markets). It is questionable whether by equal behavior with the farmers, these proper price offers, and these credits would be necessary.

Neilson (2008) ad principal services offered by such middleman to farmers in Indonesia: money lending and merchandising (sale of rice, sugar and other important products). From the interviewed farmer, only few of them admitted they have been lending money from the agent, none of them stated any merchandising.

Interviewed farmers admitted they prefer to borrow mostly from their relatives and friends than from agents. With managing this extra money in profitable way, farmers do not have to fear of the vicious circle of poverty. Respondents from the research sample answered they have used these credits mostly for education purposes or to enlarge their agriculture assets. These can be considered as the positive impact investments. But numerous farmers in the region often use the money for food and non-investing goods which is causing their dependence on the system of these loans and actually living from year to the next year from almost entirely borrowed money.

6.4 Social capital

6.4.1 Cooperatives

Cooperatives are playing important part in the livelihoods of the rural life in Indonesia. These kolompoks recognized and registered by government, can receive agriculture and any different kind of support from the state. Despite this, many farmers do not trust these institutions and many of their members are not satisfied with their function.

It can be explained by high level of corruption in Indonesia. Many farmers experienced violation of their rights and government power by the officers. It depends on each kolompok, but sometimes there are donations from government, even when they reach North Sumatra due to corruption, just redistributed among the friends of the government's officers and farmers will not get anything. Most of farmers lost their hope in situation improvement and therefore they see nothing beneficial in joining these kolompoks.

As Neison et al. (2008) wrote, the experience of Indonesian farmers with agricultural cooperatives in the past has been particularly adverse. The village cooperatives (Koperasi Unit Desa) and Agricultural Cooperatives (Koperasi Pertanian-Koptan) were such highly politicized organs, frequently acting as agents of government. In post-Suharto Indonesia, these institutions have indelible associations of corruption and political misuse, and

farmers remain cautious of organizing under the KUD structure. Nowadays cooperatives in Indonesia face great challenge due to the rapid change in global economy and open market competition. According to Suradisastra (2006), many agricultural cooperatives are struggling to exist and some even disappeared. Neilson et al. (2008) stayed it is due to the fact they are unable to provide the same services as traditional market mechanisms, such as free access to credit and simple marketing procedures embedded within traditional market cycles and have problems dealing with bureaucratic and corrupt cooperative structures.

Farmers admitted that corruption is one of the leading problems of Indonesian republic, it have been mostly farmers with whom we had closer relationships. Overall discussing about these topics is officially found inappropriate while many farmers are still afraid of the previous political regime.

Suradisastra (2006) suggest that the government should reduce its intervention towards the cooperative movement and strategy and focus on revitalization of the existing agricultural cooperatives; they should be in line with the need of the stakeholder of agriculture development. Neilson et al. (2008) proclaim that in case of effective cooperatives, numerous potential advantages emerge as collective marketing, labor sharing, revolving credit, and knowledge dissemination.
This form of organization, however, is far from widespread in the coffee regions of Indonesia and it is questionable whether cooperatives are necessarily most effective in delivering services to individual coffee growers. From the interviewed group of farmers, some already started creating own groups based on their own effort and experiences. These groups were called by many researchers (Bebbington et al., 2006) the key element for any future development.

It also correspond with the extension services provided to the farmer trough these kolompoks and cooperatives. Many hardships are associated with this issue. Lacking efficiency of these services often leave farmers very harmful. One of the cases is the guidance about the correct coffee cropping. Most of the farmers owns coffee field with plants usually suitable for rehabilitation. Coffee tree is able the produce beans with adequate quality just for ten years. Over sixty percent farmers admitted lacking resumption on their fields by coffee cultivation over eleven years, seven percent of the interviewed farmer even stated over twenty years without any rehabilitation. Due to this fact, many of the farmers meet the problem of any king of illness and bean damage caused by the aging

of the trees. Many farmers answered their ability to promote this kind of coffee on the market is negligible or at the cost of low purchasing price. Because of those and other experiences, most of the farmers do not see any benefit in them.

6.4.2 Certification

Consumer concerns over the environmental and social conditions of coffee production have led to the proliferation of sustainability codes, certification schemes, and labeling claims in the sector (Neilson, 2008). Especially in the case of North Sumatra, North Tapanuli regency, all interviewed farmers were planting Arabica coffee. Due to the natural conditions, altitude and soil quality, this area is well known by its specialty and high quality coffee.

Owing to the unique character and body coffees of Northern Sumatra is in high demand from major specialty coffee buyers (Ottaway, 2007). Mandheling coffee, developed in fields, which spread in South Tapanuli, North Tapanuli, Simalungun, and Deli Serdang. Mandheling title itself is taken from the name of the Batak tribe, Mandailing. As Ottaway (2007) stated, the specialty coffee of Indonesia is well known in the industry, commands a very high price and is experiencing growing demand in the marketplace. Thus inability to increase production is a constraint reported by a number of suppliers.

Currently, 46 Indonesian coffee companies have been certified with total certified coffee of 47,000 ton per year (Wahyudi and Jati, 2012). According to the farmers, production of coffee itself does not guarantee significant bargaining power in the industry for the farmers. Application of sustainable farming system certification is one of the efforts to gain better income for famers and coffee supply chain. Neilson et al. (2008) proclaim that specialty markets also demand greater corporate attention to reputation, brand management, and risk minimization. For the coffee certification is mostly required formation of the farmer groups, cooperatives, or another equivalent organizational form. Often also requires facilitating inspection and monitoring.

Especially in the case of North Sumatra, when almost all produced coffee meets the requirement for its special taste and quality, certification and specialization of the coffee support the farmer to maintain and even improve their economic stability. But it is not just the coffee certification, the increase in public awareness about the certification is also

necessary to meet this goals, whether in sustainability, preservation of natural resources and biodiversity, or precisely in improving the competitiveness of smallholder farmers and increase their share in the revenue from coffee. From the farmers, only three of them knew about the coffee certification as Fair Trade.

Numbers of certification programs located at north Sumatra are by Wahyudi and Jati (2012) mainly Utz Certified, Organic, Rainforest Alliance, Fair Trade and others but only one from the interviewed farmers was member of cooperation planting the certified coffee, it is the Kopi Luwak (Civet coffee in English), which is a globally recognized as the coffee with the best flavor and history. Marcone (2004) states an annual production of under 500 pounds and a price tag of 450 € per pound. It obtain the reputation of being the rarest and most expensive coffee or beverage in the world, it is due to unusual and quite unexpected method of production, it passes through the digestive tract of the small animal, in Indonesian called Luwak.

The Wahyudi and Jati (2012) found trough observation in farm level, that Sumatran smallholders did not fully understand the intention and objective of respective programs. The number of certification programs lead to confusion at farmer level in responding to their required criteria and indicators. Also Neilson et al. (2008) conclude, the sustainability agenda is often being driven by corporate interests who, often in partnership with international NGOs, are eager to demonstrate their ethical credentials to discerning consumers. This corporate engagement has significantly broadened the number of producers, there are, however, several implications for smallholder production systems and industry structures when powerful corporate actors begin to require certification, traceability, and adherence to foreign-authored compliance systems. Ottaway (2007) on contrary stayed that there seems to be good understanding of the certification process but admit that Association of Indonesian Coffee Exporters AEKI – North Sumatra is ineffective in this regard and it is questionable that the formation of any other board or association would accomplish the desired objectives of creating more direct linkages between specialty coffee buyers and sellers.

These information are substantiated (Wahyudi and Jati, 2012; Neilson et al., 2008; Ottaway, 2007). When almost half of the coffee, produced by interviewed farmers, ends in the purchasing factory in city Siborong Borong, which is linked to the Starbuck coffee brand. This factory sells directly to Starbuck factory in Medan, and in the USA market is

sold as Fair trade certified. Due to this fact, half of the interviewed farmers are producing the coffee which will be most probably certified as Fair trade and they do not know it.

6.5 Coffee value chain development

Coffee processing and marketing is considerable labor demanding. When the farmer harvest, process and dry the coffee in form of green beans, has over three possibilities to whom and where sell it.

Most of the farmers from the North Sumatra are approached by the agent. Due to often personal relationships and near or distant kinship, this way is still considered among the farmers as traditional one. Many farmers answered it would not be appropriate to sell the coffee to someone else when there is a member of family working as coffee agent. Even when the price offered by these agents is mostly lower than purchasing price in the factory located in the same area, they still choose the agent.

These agents are mostly linked with the regional agents and the destination this coffee is the market in Medan connected to international companies. As the Neilson says (2008), it is not uncommon for coffee to change hands three or four times along traditional trade networks before reaching processing mills or exporters.

Price of the coffee purchased by agent depends on many factors. Some farmers sell coffee directly to the middlemen, and some wait for the middlemen to come to their house. The middlemen or so called coffee agent is the one who state the price, which range between 14 - 17,000 IDR per kg of dried coffee beans. Similar numbers also state Wahyudi and Jati (2012).

As the factors affecting the coffee price purchased by agents are mostly coffee quality, bargaining power of the farmer, relationship with the agent and also education, or knowledge's of the farmer. Very popular among the agents is to describe the farer´s coffee as low quality and therefore the agent offer the lower rice explaining that this kind of coffee is going to be used for gunpowder production or production of cosmetic. There is also different kind of agents with long term business relationships with the farmer, when the household lack cash security, farmer offer a loan without any interest but conditioned with a special pre-emption right for their next harvest and also with lower price for it.

Farmer agrees and then starts the vicious circle of poverty when farmer is living each year from the money from their next harvest.

Second way for the coffee, represented by fifteen percent among the interviewed farmers, is selling their production at local market. The farmers sell the coffee in the form of beans. If they want to roast the coffee, they usually make it in a traditional way, by cooking the beans in a frying pan and pounding it by themselves.

Last but not least possibility for the farmer, with increasing tendency, is selling their production to the factory at Siborong Borong as it was mentioned above. Thirty–three percent of interviewed farmers prefer this option. Factory offer mostly the highest purchasing price in the region and so it is very popular among the farmers. This factory is linked to the Starbucks Company which stands for one of the most significant power players in Indonesian value chains. It is also possible that from the second group of the farmers, selling their production at local markets, the certain amount of it end also within the Starbuck branded coffee, which is at the global market sold as Fair trade certified. Only abundant number of the farmers knew that factory is linked to the Starbucks coffee brand and the coffee is sold on the global market as certified.

6.5.1 Global private regulation

As Neilson et al. (2008) recognized, within the specialty Arabica-growing regions of Indonesia, a parallel set of value chain regulation has been emerge. The rapid global expansion of the Starbucks Coffee Company, with its buying power in these regions, is starting to dominate local trade systems, with the company's CAFE´ Practices program driving change in upstream producing regions. Wahyudi and Jati (2012) accounts that the share of regional exports being sold to Starbucks suppliers in each of northern Sumatra is now approaching 50%. Ottaway (2007) even proclaim that the majority of Arabica coffee exported from Indonesia, by Starbucks, reach the level of 60-80 percent. Currently Starbucks five suppliers: PT Sarimakmur (supplies 4 times the amount of other suppliers), PT Indo CafCo (ECOM Coffee Group), Volcafe, PT Menacom and PT CBI, the overall situation in the value chain is changing.

According to Barret et al. (2012), these channels employing sophisticated management methods, such as costly grades and standards or vertical coordination or integration of activities that profitably add value to raw commodities through transport, storage and/or processing. Participant farmers, whose comparative advantage allows them to tap the latent demand of better-off or more distant markets made accessible by emergent agricultural value chains, typically improve their productivity and profitability, thereby further stimulating commercial demand and supply.

On the contrary, Ottaway (2007) say that there is little evidence that farmers have direct relationships with buyers. Market linkages exist between those in the middle of the supply chain (exporters and importers, exporters and international trading companies).

As Neilson et al. (2008) stayed, whereas Indonesian exporters based in major port cities would traditionally rely on loose relationships with regional traders from the coffee regions. Before Starbucks started buying Indonesia coffee to any degree, farmers and collectors worked together to supply exporters with coffee. Exporters are now establishing operations which allow direct purchasing from farmers in the growing regions themselves. Kaplinsky (2004) also recognized the growing asymmetry in commodity value chains.

It is common that these big stakeholders often abuse their dominant market position. Also Petkova (2006) similarly emphasizes the weakened role of state-territorial regimes, and associated rise of value chain leaders. Ottaway (2007) is his article quotes the Indonesian Ministry of Agriculture. They state as overall objective to build close and direct supply chains (on contrary to the recent situation). Part of their goal is also to change farmer from producer to supplier. Most of the interviewed farmers in the study do not believe it is possible.

With global private regulation including various aspects of crop management, trading companies are necessarily becoming involved in smallholder agricultural extension. Neilson et al. (2008) doubt whether the capacity of these companies to deliver effective agronomic advice is uncertain and try to supplant the traditional state-provided extension structures (which in the case of the Indonesia coffee sector have been mostly ineffectual).

Neilson et al. (2008) predict that global private regulation will continue to dominate global value chain dynamics and governance structures in the coffee industry in the coming years, particularly in the highly brand-oriented specialty sector. Petkova (2006) agreed on this

and add that there is the potential for global private regulation to undermine existing institutional structures, such as elected governments, trade unions, and protected area management systems. These implications of corporate self-regulation may be forcing a new set of global regulatory structures for addressing social development and environmental conservation.

Although Blowfield (2003) points out that even when some of the changes in businesses' notions of responsibility brought by ethical sourcing, once one gets beyond the broadest definitions, sustainability needs to be recognized as a contested and subjective concept. This is not mostly the cast many of the multinational stakeholders in coffee agribusiness are using.

6.6 Limitation

The results of the study are based on the information obtain from 54 households, therefore they cannot be generalized to overall population at North Tapanuli regency or North Sumatra province. Data have been collected during summer 2012 and there is no comparison with the previous year's data, they are therefore cross–sectional without possibility to make prognoses towards next seasons.

During the interviews with 54 farmers snowball method has been used to approach the farmers. Generally locals do not trust the foreigners or even the Indonesians who they did not know. Due to this fact, when we get contact on a direct farmer, he or she was willing to share his information with us. Several questions have a private character and especially questions concerning money are not recognized as polite among the local ethnic. By approaching households without previous connections, farmers would refuse to take part in the research. By this snowball methodology, certain information bias could occur in the collected data. There is a probability that these approached farmers belong to the similar group and therefore have similar experiences.

In local culture it is common that approached farmers expected financial or material gift for their cooperation, without it some of them refuse to collaborate. That is linked with the overall situation in Indonesia corresponding with the level of corruption. It is not a kind of corruption experienced in developed countries, in many countries, as Indonesia, it is more linked with the traditional way of life.

Local culture and language meant another limit within our research. Many traditions from the original ethnic Batak mixed with their prevailing Christian religion and Islam influences from the rest of Indonesia. Indonesian language is the official one in Indonesian archipelago, nevertheless many farmers had just basic knowledge and they have been speaking the local Batak language. Our translator was capable to speak this local language but due to the many cultural differences, there was an effort from his side to refine the questions and responses received. This could lead to a data bias.

6.7 Recommendations

Many farmers at the research area do not have access to sufficient education. Especially with the coffee production, marketing and sell, it is needed to improve the situation. These educations training should be provided/ are officially provided by the numerous governmental extension services. But the connection in-between these extension agents and smallholders is negligible. By training these farmers to be more experienced in the process of coffee growing numerous disease and quality issues would be solved. By producing high quality coffee (with adequate fertilizers and pests) new markets and higher incomes for the farmers can be reached. Also lacking management a selling skill leave farmers vulnerable in the coffee value chain. None of the trainings in the area have been focused on it. Farmers are left to use their own skills and common sense to compete with the agents, middle-men and newly multinational companies.

In the times of global private regulation and quality coffee demand, numerous solutions are available. Indonesian government by cooperation with multinational companies and traders should support a new model of extension services based on the latest methods and experiences from the international sphere. These can be supported by the multinational companies meeting the problems of insufficient specialty coffee supply. In case of North Sumatra, there is higher demand for specialty and certified coffee than the supply. By training farmers how to produce greater volume of quality coffee, both players in the market, as the government and the international society, would benefit. Government as a provider of social and economic security should encourage these programs but at the same time secure, that the smallholder will be recognized as equal partner to the international companies.

By cooperation more other obstacles for development can be solved. By infrastructure development in the area, many smallholders and even multinational companies would benefit by easier transportation of the products, development of local services sector and by capacity building.

7 Conclusion

The thesis objective was to analyze the current situation of the coffee small-holders at the North Sumatra and to examine their linkages within the coffee value chain, identify the key cash income generators in the local area and to discover the possibility to enhance their situation with suggestions for improvements.

For the small-holders at North Sumatra coffee cultivation means a decent source of cash security. Compared to farmer specialized to different crops, coffee generated income has been found as more stable. Many farmers also diversify their production so they are not dependent only on the coffee and have security potential in the case of any unexpected poor harvests or price declines. Farmers, however, are largely dependent on themselves and do not receive much support from any government authorities. Promised assistance from the local extension agencies is not efficient enough to secure them with necessary knowledge and advices.

The entry of new players in the market is also changing the traditional value chain in the coffee industry forward the newly recognized global one by large multinational companies entrancing the local markets at North Sumatra. Local agents and middlemen have to compete with the corporation trying to gain their market share. From the point of view of the local farmers, this situation can bring both positive and negative aspect, depending on the farmers' involvement and activities. It can offer new development opportunities for the local smallholders but at the same time threat of decreasing farm-gate prices of coffee.

From different methods of increasing the share of total price in favor of coffee smallholders, the most widespread at North Sumatra is variety specialty and certified coffees. Small number of interviewed farmers are already profiting from these kinds of coffee marketing with the growing tendency among the other smallholders. It is very suitable method within the special conditions at North Tapanuli regency when the Arabica coffee, they are producing, already reached various certification or specialty criteria and is still sold at the global market as a normal coffee for average prices.

Certification and specialty coffee is the easiest possibility for the rural poor to reach sustainability in the value chain and it promotes their social and economic security as well as natural heritage conservation.

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ANNEX

List of Annexes

Annex 1. Semi-structured questionnaire

1) Name: _____
2) Name of the village: _____
3) Age: a) till 15 b) 16 - 25 c) 26 - 40 d) 41 – 55 e) over 55
4) Gender: a) male b) female
5) Education (last received): _____
6) How many family members live in one house: a) 1–3 b) 4- 6 c) 7-10 d) over 10
7) Amount of family members under 15 years: a) 0–2 b) 3-5 c) over 6
8) Are you part of the farmers' group (kolompok)?
   a) yes and I find it helpful
   b) yes, but not useful for me
   c) no
9) Do you pay the membership fee? a) yes b) no

10) What is the size of agriculture land you are working on? _____

11) What is size of your agricultural land area planted with coffee? _____

12) What kind of coffee do you produce? a) Arabica b) Robusta

13) What method do you use for the coffee planting? a) monoculture b) polyculture

14) Do you/ your group bake /roast coffee? a) yes b) no

15) Where do you sell your coffee? a) to agent b) to the factory c) to market d) both – agent, factory

15) Does the agent approach you? a) the agent comes to me b) I have to approach the agent

16) Does the agent give a higher or lower price than the manufacturer or the market? a) higher b) lower

17) Do you know for what is your coffee later used? a) yes _____ b) no _____

18) Have you ever heard of certified coffee? a) yes (skip to question 20) b) no (go to question 19)

19) Are you interested in more information about the coffee certification? a) yes b)no

20) Do you have a certified copy? a) no b) yes - which? _____

21) Did you received education or extension service about the coffee? a) yes b) no

22) What is your total farm income? (Average in Rp /month) _____

23) Do you have another source of income? a) yes (job, subsidies, pension): _____ (Rp/month)
   b) no

24) Do you have any loan /debt? A) Yes - You received a loan from: a) family b) neighbors /friends
   c) Bank B) No (skip to question number 28)

26) How much did you borrow (Rp) _____

27) What is the purpose of the loan? a) farming b) education c) food d) health e) other _____

28) How many times a year you harvest the coffee? a) there are 2 big seasons and 2 small seasons
   b) just in the big season c) all year d) another option _____

29) For how much do you sell the coffee? (RP/kg) _____

30) Do you hire people in time of harvest? a) yes b) no

If YES: a) How many people do you hire during the high season and how many days they work? ___
b) How many people do you hire during a small season and how many days they work? ____
c) What is their salary per day? _____

31) How many kg of coffee do you harvest a) in big season _____ b) in small season _____

32) How often are you replanting your coffee? a) continuously b) When the coffee is old - how old is your coffee? _____ c) When the coffee stop to produce - how old your coffee? _____

33) Where did you get your actual coffee trees? a) from my own plants b) from market/nursery c) get from friends /family

34) Do you use any machinery in coffee processing? A) coffee machine manual leather B) another machinery _____

35) Do you grow other crops or have livestock?
Crops: _____
Livestock: _____
Crops or livestock that you sell in the market: _____

36) Do you use pesticides or fertilizers? A) yes - a) organic b) chemical c) organic and chemical B) no

Annex 2. Coffee at North Sumatra

Annex 3. Research area – Lake Toba

Annex 4. Gani Silaban – producer of the Kopi Luwak

Annex 5. Drying coffee beans at local factory

Annex 6. After interview with the farmers at North Tapanuli regency

Technical note

Currency exchange rate as of 24th April 2012:
1 US$ = 9715 IDR