AN ECONOMIC ANALYSIS OF PARTNERSHIP FARMING IN THE VISAYAS, PHILIPPINES

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Abstract

Partnership farming, a non-binding version of contract farming, links smallholder producers to large-scale processors and integrates them into high-value markets. The private sector invests in farmer training and as a result can meet its quality and sustainability standards with a steady supply of agricultural products from partnered farmers. This paper aims to contribute to the newly growing pool of literature on partnership farming as a tool for pro-poor rural development by investigating the partnership program of one particular coconut processor in the Visayas, Philippines. The effects of the partnership on smallholder coconut growers' copra yield, price received for copra, and copra gross margin are examined using propensity score matching procedures. The results show that for these outcome variables, partnership farmers are no better or worse off than their non-partnership counterparts. The failure of partnership farming as a development tool in this particular case can be blamed on both the firm and the farmers. The firm does not provide sufficient training and its pricing system in not transparent, while the farmers are not well organized into a cooperative and therefore have poor access to market information and no bargaining power. Future research should evaluate other partnership programs with different commodities to pinpoint the circumstances that make partnership farming a success.

Keywords: partnership farming, coconut, copra, propensity score matching, Visayas, Philippines

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1. Introduction

This section provides a summary of the paper, an overview of partnership farming, and a literature review.

1.1 Summary

This research paper begins with an overview of partnership farming, the coconut sector in Leyte, and the three main stakeholders. Practical preparations are described, and then the methodology is outlined. Data and descriptive statistics are reported, as are the results from quantitative and qualitative analysis. Finally, conclusions are drawn and policy recommendations are made.

1.2 Partnership Farming

Partnership farming is a further development of out-grower schemes that is emerging as an alternative to contract farming due to its sustainability and strong potential to integrate smallholder farmers into high-value markets. The concept combines smallholder agriculture with large-scale processing; the private sector invests in training farmers and as a result can meet its quality and sustainability standards with the steady product supply from partnered farmers (Breuer and Schellhardt, 2010).

Partnership farming is characterized by careful market analysis by the private sector, examining the value chain starting with the consumer to see what opportunities exist; investments by the public sector in infrastructure to make transport more efficient and to improve post-harvest activities; organization of farmers into well-informed groups with better bargaining power; and education of farmers by both the public and private sectors so that farmers may become independent entrepreneurs who are well trained in their respective commodities (Breuer and Schellhardt, 2010).

In order to understand the potentials of partnership farming it is important to be familiar with contract farming. The Food and Agriculture Organization of the United Nations (FAO) (2011) describes contract farming as “agricultural production carried out according to an agreement between a buyer and farmers, which establishes conditions for the production and

marketing of a farm product or products". Generally, a farmer promises to deliver a certain quantity of agricultural product to the buyer at a specified time and a set price, and in return the farmer is guaranteed that his product will be purchased and in many cases is given production support in the form of farm inputs and extension service.

Benefits of contract farming from a farmer's perspective include: better market access; lower operational risk, due to assured prices and markets; higher and safer returns to investment; and loans in kind, usually as inputs, like fertilizer or seeds, and technical advice. Purchasing companies benefit from the secure supply of agricultural goods flowing in at the agreed upon time, quantity, and quality. Certain risks are associated with contract farming including: side-selling (extra-contractual marketing), whereby a producer sells to a buyer offering a higher price thus avoiding repaying the input loan; refusal by the purchasing firm to pay the previously set price or to make the full purchase; and under-valuing or downgrading of delivered products by the buyer (FAO, 2011).

As contract farming becomes more widespread, its effect on rural development and its implications for poverty reduction need to be closely examined in order to make sound policy recommendations to developing countries. A substantial pool of research on contract farming exists, but the subject has by no means been exhausted. There are numerous research gaps regarding the success of contract farming in specific crops and areas. Few papers, if any, can be found about the effects of contract farming on coconut growers in the Philippines. There also are few investigations into the possible variations on contract farming, for example, those agreements which do not bind farmers exclusively to a purchaser. Partnership farming could potentially eliminate much of the risk taken on by both farmers and agribusinesses under traditional contracts, thereby making partnership farming an attractive tool for pro-poor rural development.

1.3 Literature Review

Current literature focuses on the advantages and disadvantages of contract farming as well as what can be done to make the arrangements more profitable for both farmers and firms. Valuable contributions to the research pool could be made by investigating what

variations in contracts, such as partnership farming, are best suited to pro-poor rural development. In the literature, the term "partnership farming" is widely interchanged with "contract farming". In this paper partnership farming strictly refers to the type of contract farming in which there are no formal contracts, and the agreement is non-binding. Few papers can be found on true partnership farming, but research on contract farming is highly relevant and conclusions from it are applicable to partnership farming.

In an analysis of contract farming in Sub-Saharan Africa, Minot (2011) finds that smallholder farmers gain access to more profitable markets than they otherwise would, and through input loans are able to switch to sophisticated, higher-value production. Whether or not these high-value commodity markets are worth entering requires further investigation, but so far results seem positive. In their 2005/06 study of baby corn farmers in Thailand, Thanyakhan and Limsombunchai (2009) found that operating under contract raises profits and offsets the higher production costs associated with high quality products.

Contract farmers' economic welfare is especially enhanced when the contracting firm demonstrates a sense of social responsibility. Western consumers are ever more concerned with traceability of goods and fair labor practices, creating a unique market niche in which contract farming is ideal. Dr. Anton von Weissenfluh, the CEO of a major Swiss chocolate company, explained in an interview with Fromm (2010) how his firm has taken advantage of the product differentiation opportunity and simultaneously improved the livelihoods of Honduran cocoa farmers. Von Weissenfluh goes on to describe how because intermediaries are eliminated by contract farming, his firm can pay producers up to 35% more of the FOB price for cocoa beans. Transparency and social responsibility are key to poverty reduction; otherwise the buyers in contract farming will simply pocket the extra profit. However, even if the contracting firms' motives are not entirely benevolent, contract farming as an alternative to classic vertical integration appears to be better for rural development because land is permanently cultivated and owned by local farmers. In a 2007 interview (Rediff India Abroad), India's Union Agriculture Minister Sharad Pawar expressed preference for contract farming over traditional land leasing to the private sector for that reason.

With regard to the common breach of contract issues, some solutions are presented by researchers. In a review of contract farming in Kenya, Strohm and Hoeffler (2006) highlight the need for farmers to take collective action in order to increase their bargaining power in contract negotiations. Porter and Phillips-Howard (1997) and Minot (2011) would like to see more firms hiring contract mediators to keep an open line of communication with farmers and to assure satisfaction on both sides of operations. The ideal liaison officer would be a respected, indigenous member of the community, and formally trained in handling the intricacies of contract relations (Porter and Phillips-Howard, 1997). To avoid problems with downgrading and under-valuing of products upon delivery, Porter and Phillips-Howard (1997) and Minot (2011) recommend the use of participatory grading systems; farmers and firm representatives should weigh and grade products together to prevent either side from feeling cheated.

Besides the aforementioned risks of contract farming, other drawbacks include a possible detriment to food security and the exclusion of very small farmers. Dr. Kishan Bir Chaudhary of Bharat Krishak Samaj, an Indian farmers' forum, is concerned that contract farming will lead to the doubling of India's agricultural exports, greatly reducing the domestic food supply and making India dependent on imports for food security (Rediff India Abroad, 2007). Porter and Phillips-Howard (1997) are similarly concerned: in Africa they observe farmers replacing staple food crops for home consumption with cash crops for contract farming, thereby becoming reliant on market prices for food security. Because it tends to exclude very small-scale farmers, contract farming may exacerbate income inequality and lead to social tension within communities (Minot, 2011).

The conclusion that many researchers come to is that contract farming is a useful tool for rural development, but it is not equally successful for all commodities in all regions. Contract farming best serves those sectors in which there are large economies of scale for processing but none in production (Minot, 2011), and in which goods are perishable and farmers lack post-harvest technology (Strohm and Hoeffler, 2006). Nagaraj et al. (2008) compare the returns to rupees invested between contracted chili farmers and contracted baby corn farmers and find that the contracted chili farmers get fewer returns than the contracted

baby corn farmers, but better returns than either type of open market farmer. This paper will investigate the suitability of coconut cultivation to partnership farming by analyzing the partnership arrangement of SC Global, a coconut oil processor in Leyte, Philippines.

To ensure the success of partnership farming, the private and public sectors as well as the farmers must fulfill their roles. The private sector is responsible for analyzing markets and value chains to find opportunities for partnership farming, and it should provide farmer training and agricultural inputs to boost the farmers' potential to thrive within the partnership arrangement. The public sector needs to invest in infrastructure to improve post-harvest activities and reduce unnecessary losses during farm to market transport, and it should also provide farmer training as a healthy agricultural sector is in the best interest of a nation. Ultimately, the success of partnership farming depends on the farmers themselves; they must take the initiative to make arrangements work in their favor by organizing themselves into well-informed groups with bargaining power (Breuer and Schellhardt, 2010).

2. The Coconut Sector in Leyte

The area of study, Baybay, is located in the province of Leyte in the Eastern Visayas, in the central Philippines. The Eastern Visayas, or Region VIII, lies between the Bicol Peninsula in the north, Mindanao in the south, Cebu and Bohol in the west, and the Pacific Ocean in the east. Region VIII, which has a total land area of 2.2 million ha, is comprised of three islands: Leyte, Samar and Biliran (GIZ, 2010). The island of Leyte is 0.7 million ha in size, and is divided into two provinces, Leyte and Southern Leyte (GIZ, 2010). The city of Baybay is on the west coast, in District V of Leyte. Baybay's coast line is flat, but quickly rises into a mountain chain covered in rainforest. The foothills of these mountains are ideal for coconut cultivation. Baybay's location in the Visayas can be seen in Figure 1.

Figure 1: The Visayas, the central island region of the Philippines. Source: Adapted from Google Maps

Region VIII is very rural with just a seven major cities, and it scores quite low on national income, expenditure, savings, and literacy rankings. Tables for these demographic features can be found in the Appendix (Table A1 to Table A5). The agriculture, fishery and forestry sector is the second biggest contributor to regional gross domestic product (RGDP), after the service industry (GIZ, 2010). Cropland is 45% of Region VIII's total area, 71.4% of which is planted coconut, 19.4% of which is rice, 5% of which is abaca and the rest of which is sugarcane, corn and root crops (GIZ, 2010). About 11% of the Philippines's 3,243,424 ha of total harvested coconut area is located in the Eastern Visayas (Strategic Development Cooperation - Asia, 2006). Eighty-one percent of Region VIII's 71.71 million coconut trees[1] are bearing, the remainder are either senile or not yet bearing (GIZ, 2010 and Strategic Development Cooperation - Asia, 2006). Coconuts are a major feature in the Philippine economy; the country is the world's leading coconut product exporter, with an estimated total world exports share of 59% (Strategic Development Cooperation - Asia, 2006). Western Europe imports around 500,000 tons of coconut annually mainly from the Philippines, but some also from Papua New Guinea, Vanuatu, Mozambique and Malaysia (Encyclopædia Britannica, 2012). The coconut sector is similarly important to Leyte's local economy, where 32% of Region VIII's 649,030 ha of coconut lands are located (GIZ, 2010).

What makes the coconut a valuable crop is the wide array of products into which it can be processed, many of which are derived from copra. Some companies accept only the whole coconut from farmers, but it is more common in the Philippines for farmers to remove the husks themselves and sell the dried white meat (endosperm), called copra. A diagram of the coconut is given in Figure A1 of the Appendix. Copra has approximately the following composition: 64% oil, 6% water, 5% fiber, 16% sugars, 7% protein, and 2% minerals (Sutherland, 2012). The low water content of copra, as compared with fresh coconut, makes it less likely that bacteria and fungi will grow on the flesh. To make copra, the endosperm is removed from the coconut shell (endocarp) in hemispheres, and then dried by smoke, sun, or kiln. While water content is the primary determinant of copra quality, and therefore selling price, there are other factors. Premium grade copra is dried by hot air, it is clean, has no discoloration, no

[1] Coconut trees are not technically trees, they are palms and as such they are monocotyledons and are loosely defined as a grass. The coconut seed or fruit is not a nut, but a drupe.

smoke stains, no mold or insects, no charred pieces, no signs of germination, has less than 6% water content, and has less than 3% fatty acid content (Sutherland, 2012).

Smoke drying yields low quality copra because of the charring and staining involved. Sun drying can yield high quality copra because no discoloration or charring is caused, but it can be difficult to reduce the water content to under 6% in such a humid climate as the Philippines has and impossible during the rainy season. Kiln drying, if done properly, yields the highest quality copra as it is thoroughly dried and has no discoloration. The high cost of a drying kiln means that few smallholder farmers have access to one. Those that do are usually members of a cooperative that has pooled funds to buy one for the group's use. The farmers in the research area do not belong to kiln owning cooperatives so they dry their copra in the sun on large sheets of tarp lying in the road or on village basketball courts.

The majority of respondents said that they sell their copra *pasa*, meaning that they partially dry the copra, and then sell it on to the middleman who assumes responsibility for a second round of drying to reduce the water content adequately. Farmers choose to sell *pasa* because it reduces the amount of time they spend working, and it minimizes the risk that the copra will rot or be stolen or eaten before they can get it sold. Passing the risk on to the middleman means that the farmers receive a much lower price than they would if they were able to employ more advanced post-harvest technologies like kiln drying.

Upon receiving the copra from farmers or middlemen, a mill will process it into crude coconut oil. The processing results in the byproduct of copra meal, or cake, which is an ingredient for animal feeds. The crude oil is then further processed into biodiesel, low acid oil and cochin oil. Cochin oil is refined, bleached and deodorized so that it, as well as low acid oil, can be turned into oleochemicals for use in cosmetics and food (GIZ, 2010). Copra can also be processed into virgin coconut oil, for cooking and health uses, and coco methyl ester, for diesel fuel or diesel fuel enhancers (GIZ, 2010).

Aside from those products derived from copra, there are many more which can be produced from the coconut and its plant. Many farmers use the coconut shell (endocarp) for handicrafts, or as fuel for smoking copra or for home cooking (Strategic Development Cooperation - Asia, 2006). The shell can also be brought to a factory for processing into

granulated charcoal, and then activated carbon which is used in water, air and food purification, solvent recovery, and pharmaceuticals (GIZ, 2010).

The coconut husk (mesocarp) is made of strong fibers (30%) which can be processed into coir for geotextiles, to include upholstery padding, floor mats, mattresses, ropes, netting, screens, and erosion control systems (GIZ, 2010; Strategic Development Cooperation - Asia, 2006; Villamor, 2012b). The other 70% of the coconut husk can be dried into coco peat, then left to partially decompose for one year so that it may be used as a soil enhancer (Villamor, 2012b). Leaving the coco peat to further decompose for two to three years creates black coco peat, an excellent fertilizer (Villamor, 2012b). Coco peat is highly absorbent and is good for cleaning up accidents, like oil spills, and is emerging as an alternative to straw, wood shavings or rice hull for livestock bedding because it so effectively locks in moisture and odors (Villamor, 2012b).

Coconut plants are also cut down and their stems used as an inexpensive lumber substitute in construction (Strategic Development Cooperation - Asia, 2006). This is a good use of senescent coconut plants and should be encouraged as a profitable use for 6.3 million senile trees in Region VIII (GIZ, 2010).

As far as comestibles go, there are the coconut products that are common in Western supermarkets: coconut milk, coconut water, and shredded coconut for dessert items. There is also buko juice, which is the nutritious fluid inside of a fresh, young coconut; and there is coconut vinegar processed from the sap of the plant. A traditional farmer-level activity is sap-tapping. The sap is mixed with a few additives and natural red coloring to create coconut wine, called tuba. Tuba is overpoweringly acidic, it's an acquired taste, one which is very difficult to acquire, but highly popular among the coconut farmers of the research area.

The wide range of products that can be made from coconut have the potential to positively impact Baybay's local economy. The area is dominated by coconut cultivation; a handful of existing nearby processors could bring prosperity to the area if they improved their supply chain management. Partnership farming, if executed properly, could be the key to shaping Baybay into a successful coconut product center.

Of the 46,200 hectares that make up Baybay, 16,360 are planted with coconut (Philippine Coconut Authority, 2010). Baybay has a total of 2,080,472 coconut trees, 1,657,477 of which are bearing, and 358,397 of which are senile (Philippine Coconut Authority, 2010). There are 11,683 coconut farmers in Baybay (Philippine Coconut Authority, 2010). Baybay is also home to SC Global and Visayan oil, which are two of Leyte's five oil mills. As of yet there are no operational coconut coir processing plants in Baybay, but in addition to its normal business activities SC Global plans to be fully operational as a coir processor by the end of 2013 (Licup, 2012). Baybay is also where Green Carbon[2], an activated coconut carbon plant, and SPMI, a coconut shell fuel processor, are located. These four coconut processors in Baybay are effective in absorbing the local coconut supply, as evidenced by the fact that none of the 100 research respondents reported being unable to sell their produce. It would be expected that the four coconut processors would also be major sources of employment of the locals; whether or not this is true is unclear because many Baybay residents complained that the factories recruited their workers from major cities like Cebu and Tacloban and refuse to hire locals.

[2] Green Carbon Inc. claims on its website (www.greencarboninc.com) that it is "committed to cleaning the environment and protecting human health by producing coconut shell activated carbons which are efficient for air and water purification". However, residents of Barangay Maybog, Baybay, where the processing plant is located, live in homes coated in black carbon dust, inside and out. Complaints by the residents to politicians, many of whom benefit directly from the company's presence, have been ignored. The health impact that this pollution may have on villagers is unknown.

3. Stakeholders

As mentioned earlier, successful partnership farming is contingent upon the cooperation and responsibility fulfillment of the three main stakeholders: the farmers, the public sector, and the private sector. In this section, the three stakeholders are described, but due to the paper's scope, the focus is primarily on the farmers and the private sector.

This research aims to evaluate the effectiveness of partnership farming, and in order to do so the partnership arrangement of one particular firm, SC Global, has been selected for assessment. This paper is not intended as a critique of SC Global's supply chain management, but rather should be seen as an analysis of one example of partnership farming. The purpose of this research is to look at what does and does not work in this particular setting, and how those lessons can be applied to other partnership arrangements. It is vital to note that throughout the research process significant discrepancies were found between what the farmers claim and what SC Global claims about the nature of the partnership arrangement. In an effort to remain unbiased it will be made clear throughout this paper which statements are made by whom. This researcher is grateful for the cooperation of both SC Global and the farmers and for the most part cannot weigh in on the discrepancies.

3.1 Private Sector- SC Global and its Partnership Arrangement

In partnership farming the private sector plays the role of finding lucrative markets and business opportunities as well as providing extension service and possibly other benefits to partnered farmers (Breuer and Schellhardt, 2010).

SC Global Coco Products Inc. is a Philippine company that makes organic coconut products, it has its headquarters in Manila, and its processing facility in Baybay, Leyte. The company has been all organic since converting in 2006.

SC Global's managing director, Emmanuel Licup, in a March 22, 2012, interview said that the company's founders and managers, the Licup family, are working towards breaking the feudal system that characterizes much of the region's agricultural sector. To this end, SC Global offers organic training and certification, free of charge, to local farmers so they may supply the processing facility. Ordinarily, a firm would offer these services in return for an exclusive supply

contract; but it is not SC Global's goal to monopolize the local coconut supply. SC Global benefits from the steady supply of high quality, organic coconuts that result from the training and certification, but also indirectly from the fact that they are contributing to pro-poor development in their community.

Ecocert, an independent French organic auditor, has certified 6,342 hectares of banana- and coconut-growing land through SC Global; that is 1,349 farming households in Leyte Province. Most of these farms are small in size (<1 to 24.9 hectares), but 22 of the farms are categorized as large, with more than 25 hectares. The small farms are consolidated into Organized Growers Groups, which are supervised by the International Control System (ICS), and managed by SC Global, to make sure they are adhering to the established organic standards. The large farms are also supervised by ICS, but individually, not in groups. Because of their size they need more careful technical support, and are strictly monitored several times per year, with farm visits for every harvest at least (~4 times per year).

According to Mr. Licup, organic certified coconut farmers have greater yields than their conventional counterparts. This may seem surprising as organic production is usually associated with lower yields, but in fact the training that certified farmers receive puts them a step ahead of those farmers who do not receive any technical advice. Certified farmers are encouraged to manage their soil fertility well, by using farm-based compost materials that are all natural and biodegradable. Mr. Licup says that once every year farmers are given mandatory training, and individual farmers may ask for additional technical support throughout the year, especially during the field inspections.

To minimize transport costs, and as a further incentive for farmers to supply to SC Global, Accredited Collection Points (ACPs) are scattered throughout the province of Leyte. These ACPs are where smallholder farmers deliver their dried copra to be graded and purchased on the spot. The copra cannot be burnt or moldy, and the lower its moisture level the more it is worth. Large farmers must bring their copra directly to the processing plant in Caridad, Baybay.

Because SC Global is linked to high-value, organic export markets, the price they can offer their suppliers is generally higher than that of the local conventional coconut market. Mr.

Licup claims that farmers receive additional compensation in the form of an annual monetary incentive. At the end of every year, a so-called "13th month's pay" is given as a mandatory bonus to certified farmers. The amount is determined by how many coconuts were delivered to SC Global during the year, and it is given as an incentive to remain organic.

Participating farmers are not contracted by SC Global. The company aims to improve the livelihoods of its community's farmers through training, certification, and access to profitable markets; SC Global is not interested in monopolizing the local coconut supply. The only binding contract that participating farmers enter is with Ecocert, and that is to ensure they will meet the organic regulations of the USDA, the EU, and Japan. Because there is no binding marketing contract with SC Global, participating farmers are free to sell to other processors. Mr. Licup says that "out-selling" is uncommon because of the high prices and low cost transport scheme that SC Global provides, but there is some external selling when SC Global is unable to offer a competitive price.

Farmers who are interested in participating and becoming certified organic coconut farmers must take part in a training seminar. The basics of organic farming are introduced, as are the organic regulations of the European Union, the US Department of Agriculture (USDA), and the Japanese Agricultural Standard (JAS). After the seminar, if a farmer wishes to continue with the process, his name, farm size, land tenure status, crop types, livestock, and household size are recorded. An initial ocular inspection is done by SC Global to document any adjacent rice land[3], the size of buffer zones, and property boundaries. Then if the inspector decides that the farm is suitable for organic farming, he recommends it to the International Control System. According to Mr. Licup, the main criterion for entrance is that the farmer be highly interested in joining. The transition from conventional to organic is usually quite simple because coconuts are commonly organic by default. The main risk is contamination by nearby conventional crops. The major challenge to certification is documentation, as illiteracy is rampant among rural households.

Because of the high, organic quality standards that SC Global holds, farmers who violate regulations must be sanctioned. Disciplinary measures are categorized into verbal reprimand

[3] As conventional inputs are used in rice cultivation in the region, SC Global claims to ensure that coconut plots are far enough from rice paddies to avoid contamination.

for first time offenders; temporary suspension for more serious cases; and a final de-listing for serial offenders. Examples of such violations include use of prohibited substances, such as chemical pesticides, and participating in farming activities that have a high risk of contaminating the organic production.

SC Global prides itself in its transparency and the traceability of its products. Farmers are fully documented, field inspectors record their monitoring activities, and all deliveries, transmittals, and labels are recorded. The records are kept for five years. Ecocert performs an inspection once a year for a period of about two weeks, during which time the processing facility and individual farms are carefully checked.

The major markets for SC Global are the EU (particularly Germany), North America, and more recently, South Korea and Japan. They export their products in bulk: in 190L drums, 22,000L isotanks and flexitanks, as well as bulk tankers, which are chartered boats. SC Global's organic products include: crude coconut oil, for soaps and detergents; refined and bleached coconut oil, for soaps and cosmetics; refined, bleached and deodorized coconut oil, for cooking, food, soaps, cosmetics and health products; virgin coconut oil, for food, skin and hair products and health supplements; coconut fatty acid distillate, a byproduct of the refinement process, used for detergents and paints; coconut flour, a byproduct of virgin coconut oil, a gluten-free substitute for wheat flour; coconut chips, for food, especially deserts; coconut shortening, for baking and cooking; copra cake and meal, a livestock feed additive for ruminants; coconut biodiesel, used in diesel vehicles without engine modification; and banana chips, eaten as a snack (SC Global, 2012).

SC Global has some competition from within the Philippines, but operates more or less within its own market niche and maintains market leadership in organic coconut products. For the coming year, SC Global plans to expand its network of ACPs and reestablish its Baybay ACP that was shut down due to internal theft. The company is busy adding whole nut processing to its business; eventually it will only purchase whole coconuts from farmers, instead of copra. The whole nuts will allow SC Global to start producing coir, desiccated coconut and coconut water, as well as to expand its virgin coconut oil production. Mr. Licup sees a promising market for coconut water in Europe both as a beverage ingredient and in the cosmetics industry. SC

Global is also working on getting 3,000 additional hectares of banana and coconut land certified this year (Licup, 2012).

3.2 Smallholder Coconut Farmers

The role of farmers as stakeholders in partnership farming is to organize into well-informed groups with strong bargaining power (Breuer and Schellhardt, 2010). The institutional development of farmers' groups will facilitate the transfer of technology, reduce transaction costs, and maximize agricultural productivity (Baumann, 2012). Farmers gain bargaining power when they form cooperative groups; they are in a better position to negotiate contracts and they can manage long-term investment strategies (Baumann, 2012).

Unfortunately, the farmers of the research area are poorly organized, and this is a constraint to the success of partnership farming there. Although numerous cooperatives do exist in the research area, and most farmers are members of at least one, it is apparent that they are ineffective as producers, do not truly operate as a united group with common goals, and are forced to sell their coconuts at whatever price is offered. According to GIZ's report "The Eastern Visayas Coconut Industry Development Framework", the cooperatives are ineffectual for several reasons, all of which were corroborated by what was witnessed during data collection in the field (2010). First, the farmers are unconvinced that cooperatives could be able to serve their needs and improve their circumstances (GIZ, 2010). This disinterested membership base that lacks the commitment and enthusiasm necessary to make such organizations thrive creates a self-fulfilling prophecy resulting in a cooperative that does not and cannot respond to the needs of its members. A second factor is the lack of professional management of cooperatives (GIZ, 2010). Most are led by ordinary villagers who are elected by their peers. These individuals are not trained in management and usually lack the necessary leadership skills to guide cooperatives (GIZ, 2010). Furthermore, as they do not receive salaries for their leadership position they must continue to earn a living as they ordinarily would, leaving little time to devote to the running of the cooperative (GIZ, 2010). Most cooperatives do not see the value of having highly trained leaders that would require payment as professionals, and even if they did there would be few, if any, such professionals available for

hire locally (GIZ, 2010). Another reason the area's cooperatives are weak is socio-cultural: coconut farmers have difficulty making temporary sacrifices for the benefit of all in the future (GIZ, 2010). It is unclear whether this has to do more with the local culture, a lack of trust of neighbors, or with the fact that those in poverty tend to be risk averse, but the ability to put off instant gratification for future reward is a quality that is crucial to the success of cooperatives.

3.3 The Public Sector

The role of the public sector is to provide reliable infrastructure for post-harvest activities and to provide extension services to farmers (Breuer and Schellhardt, 2010). The scope of this paper does not include analysis on this sector, but notes from an interview with a Philippine Coconut Authority (PCA) manager, as well as details of a recent GIZ funded PPP, can be found in the Appendix.

4. Implementation, Conceptual Framework and Objectives

In this section, implementation of the study is described, as are the target group, the conceptual framework, and the research objectives, questions and hypotheses.

4.1 Support and Implementation

This research was supported and funded by GIZ, as a part of the Environmental and Rural Development (EnRD) Program in the Philippines. The GIZ supervisor in Manila was the Director and Principal Advisor of EnRD, Dr. Walter Salzer. The field supervisor was an EnRD Advisor, Dominik Fortenbacher, who provided academic, logistical and practical support. The academic supervisors were Prof. Manfred Zeller, head of the Rural Development Theory and Policy Department and Prof. Regina Birner, head of the Social and Institutional Change in Agricultural Development Department, at the University of Hohenheim, Germany.

Preparatory research was carried out at the University of Hohenheim, and then the field research was done in Baybay, Leyte, from March to May, 2012. This three month period was chosen for the field research stage because it is during the dry season. The rainy season in Baybay begins in June, and the heavy rain can make navigating through mountainside villages impossible. March to May was a relatively dry period and there were few problems due to road conditions.

4.2 Target Group and Conceptual Framework

The target group of this research is smallholder coconut farmers with fewer than five hectares of arable land. It may be found through further investigation that partnership farming is better suited to medium scale producers, but for this research the smallholders are of interest. The small scale farmers constitute the large majority of farmers in the Philippines and they are one of the most impoverished groups.

As discussed in the literature, the overwhelming conceptual framework is the value chain approach (Strohm and Hoeffler, 2006). Provided the transaction costs do not negate the benefits of participation (Barrett et al., 2011), partnership farming is a profitable way to bring smallholder farmers into large scale agribusiness. It is of great developmental importance to

find a way to integrate smallholder farmers into lucrative supply chains so that they may improve their circumstances and rise out of poverty. Partnership farming could possibly be an effective avenue for this type of pro-poor development, one that carries the additional value of being mutually beneficial to large agribusinesses. It is within this conceptual framework that this study is conducted.

4.3 Research Objectives, Questions and Hypotheses

The overall objective of this research project is to analyze the yield, price, and income effects, and other potential benefits, that Philippine coconut farmers involved in SC Global's partnership farming experience. First, a thorough literature review is conducted to analyze the advantages and disadvantages of contract farming on a theoretical basis, and then empirical research is carried out to quantitatively and qualitatively measure the pros and cons of this particular version of partnership farming. Finally, conclusions are drawn and policy recommendations are made.

More specifically, there is an analysis of yield per hectare, price received per kilogram, and copra income level differences between treated (participating farmers) and untreated (non-participating farmers) households. Household interviews glean information about the risks and benefits of partnership farming, to include the effects on household income, food security, and standard of living in general. The overall aim is to provide empirical results that show the impact of the supply arrangement on farmers' livelihoods, and to explore the potential that partnership farming has for pro-poor development.

Taking into account the objectives and the background research on contract farming, four main questions emerge for this research:

(1) Do participating coconut farmers have a higher yield of copra per hectare than their non-participating counterparts?

(2) Do participating coconut farmers receive a higher price per kilogram than their non-participating counterparts?

(3) Do participating coconut farmers have a higher income from copra than their non-participating counterparts?

(4) To what extent do coconut growers suffer the risks and reap the benefits of participating in partnership farming?

The corresponding hypotheses for these research questions are optimistic. Questions 1, 2 and 3 are quantifiable, and their hypotheses are $H_1 = 1$, $H_2 = 1$ and $H_3 = 1$, respectively. H_4, which corresponds to the qualitative Question 4, is that treated farmers may suffer some risks, but that the benefits gained from partnership farming outweigh those risks and that is why they chose to remain in the treated group.

With regards to Question 1, it is hypothesized that treated farmers have a higher yield per hectare than control group farmers because of the extension service provided by SC Global. Although the coconuts must be grown without conventional farming inputs, it is assumed that the rigorous organic training will result in higher yields because non-partnership farmers receive very little extension or none at all.

The hypothesis for Question 2 is also positive; partnership farmers are expected to receive a higher price per kilogram than their non-partnership counterparts. Not only does SC Global claim to offer competitive prices, but those involved in the partnership should benefit from the absence of a middleman, receiving the mark-up that he would usually pocket. Additionally, when the annual supply-based incentive given by SC Global is factored in, the price per kilogram for partnership farmers should be significantly higher.

Mainly because of the expected higher yields and higher prices received, Hypothesis 3 is that farmers in the partnership will have higher incomes from coconuts than the control group farmers. Treatment group gross margins should be higher, not just because of the higher revenue but also because of the lower material costs. As SC Global partnership farmers are certified organic they may not use conventional farm inputs. They are permitted to use organic fertilizers and natural predators for pest control, but nonetheless they should have lower fertilizer, herbicide and pesticide costs. The labor costs for weeding, harvesting, and processing should be about the same for the treatment and control groups, but partnership farmers are expected to have lower marketing costs as their purchasing channel is pre-arranged and they should have a lesser inclination to shop around for the best buyer.

Hypothesis 4 is that although treatment group farmers may suffer some of the risks of participating in the partnership, the benefits they gain will outweigh the risks, or at least break even. Poor smallholder farmers are rational individuals (Banerjee, Benabou and Mookherjee, 2006; Mudhara et al., 2002), so if the partnership did not benefit them more than it harmed them, they would supply elsewhere.

5. Methodology

This section serves to describe each part of the methodology: the management level interviews, the household sampling and subsequent interviews, data analysis, and propensity score matching. The portion of the methodology related to propensity score matching was to a great extent guided by Tim Loos, of the University of Hohenheim, and influenced by the methodology in his 2011 paper, "To Sell or Not to Sell: Maasai Milk Marketing in Ngerengere, Tanzania".

5.1 Management Level Interviews

In order to gain perspective on the strengths and weaknesses of partnership farming from all angles, this research took place in two phases. The first phase was a series of formal and informal interviews with various partnership farming stakeholder representatives and agricultural sector professionals; and the second phase was 100 statistical interviews with smallholder coconut farmers in the research area. Qualitative assessment was derived from the first phase, and the second phase yielded both qualitative and quantitative results.

Preliminary interviews were done with GIZ's EnRD advisors Emmanuel Salvosa and Rogelio Abalus to learn about the background of EnRD in the Philippines and how the recent copra PPP fit into the big picture of agroforestry development in Region VIII. Maimai Villamor, Assistant General Manager of AFFIRE, was interviewed at the AFFIRE production facility in Matalom on both March 16, and May 10, 2012, for further information regarding the nature of the copra PPP, as well as an introduction to the state of the copra industry and how coconut farmers operate in Leyte Province. The first interview with Emmanuel Licup, Managing Director of SC Global, took place on March 22, 2012, at the firm's production facility in Caridad, Baybay, at which point the company's operations and its partnership arrangement were explained. Upon completion of the 100 coconut farmer household surveys, numerous incongruities had surfaced that needed to be addressed with Mr. Licup in a second interview on May 24, 2012. José Cardona, a GIZ Senior Advisor, was interviewed on May 16, 2012, to find out about GIZ's new copra PPP with BASF and Cargill in General Santos, Mindanao. On the May 28, 2012, Joel Pilapil, Managing Regional Director of the Philippine Coconut Authority in Region VIII, was

interviewed in Palo, for information about the PCA's role in the copra industry. A May 29, 2012 discussion in Manila with Dr. Walter Salzer, Director and Principal Advisor of EnRD, to share results of the household surveys yielded interesting insights regarding agribusiness and rural development in the Philippines. In Manila, on June 5, 2012, the founder and CEO of Kennemer Foods International, Mr. Simon Bakker, was interviewed to learn about the contract arrangement of his new cocoa production facility in Mindanao. Several informal interviews with Dr. Joe Bacusmo, President of Visayas State University and a former copra trader, gave invaluable insight into the workings of the industry. Informal interviews were also conducted with Dr. Juliet Ceniza, Head of the Philippine Coconut Research Center at Visayas State University, to learn about the relevance of various biological aspects of coconuts to the copra trade.

5.2 Household Sampling and Interviews

The second phase comprised of 100 household interviews with smallholder coconut farmers in the copra catchment area of SC Global. Forty-eight partnership farmers and 52 non-partnership farmers were randomly sampled from eight of Baybay's barangays[4]: Gabas, Patag, Guadalupe, Marcos, San Augustin, Bunga, Maybog, and Caridad (see Figure 2). These barangays were selected because of their proximity to either an Accredited Collection Point or the SC Global production facility.

[4] A barangay is the lowest administrative division in the Philippines; it can be translated as ward or district. Several barangays make up a city.

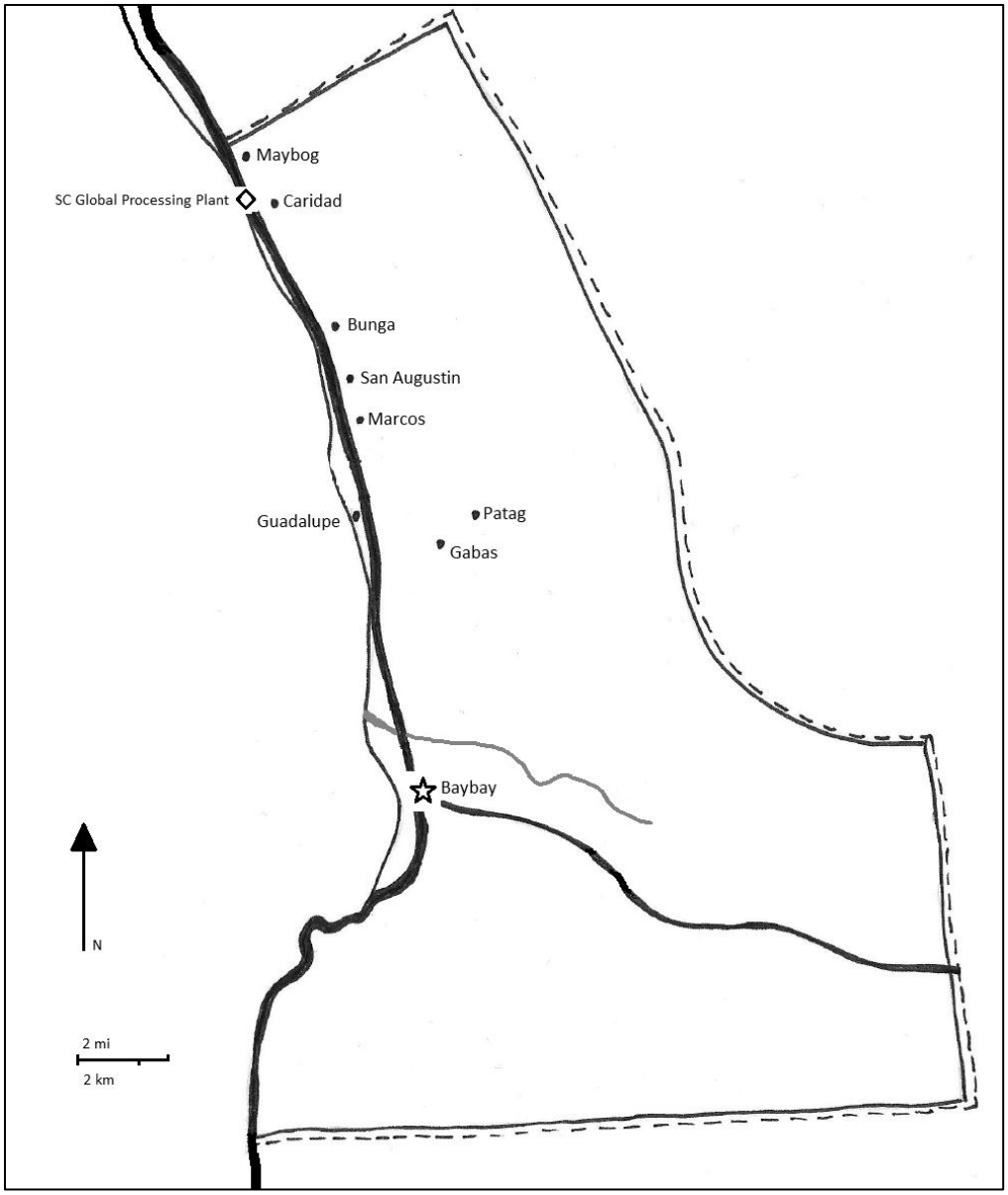

Figure 2: Locations of sampled barangays and SC Global processing facility. Source: Own drawing

Upon selection of each barangay, the barangay captain was contacted for a meeting. The objectives of the research project were explained to each barangay captain, who then granted permission to interview barangay residents. In each barangay the captain was able to provide a complete village household list from which the random sampling could be done, the exception being Barangay Maybog, where it was necessary to employ snowball sampling.

Ideally, the barangays would also be randomly sampled, but due to logistical and temporal constraints this could not be done. The fact that the barangays are adjacent to one another, have similar access to the main paved road, and are all quite near the coast may be

seen as a statistical sampling weakness. However, the author believes that this homogeneity provides a level plane on which comparisons can be fairly made; all respondents have relatively equal infrastructure endowments, distance to market, and climatic and environmental conditions. It would also be ideal to have a uniform number of respondents, both treatment and control group, from each barangay, but again, due to temporal, financial, and logistical constraints, this was not feasible. The distribution of respondents by barangay is shown in Table A6 of the Appendix.

The household questionnaires were thoroughly reviewed by a handful of individuals to include Mr. Licup, and then pre-tested in the field. After trialing and adjusting the questionnaires five times they were ready for use. There are two versions of the questionnaire, one for the treated farmers and the other for the control group. The two questionnaires are presented in the Appendix. Both were edited mainly for brevity, with the goal to fit each interview into a 30-45 minute window, and for simplicity, honing in on which units of measurement farmers were most comfortable with. For example, most farmers are unsure of how many kilometers away their buyers are, but can give an accurate report of the distance in minutes walking. The questionnaires include both qualitative and quantitative sections, with questions related to partnership participation, household characteristics, coconut production, copra price, production costs, partnership alternatives, production/partnership risks and benefits, standard of living, entering and maintaining the partnership, and perceptions on partnership farming. Ample opportunity for additional commentary by respondents was provided, which proved valuable because some important qualitative insights were gleaned from unsolicited and unexpected remarks by the farmers.

The household interviews were completed during April and May of 2012, an ideal time frame because the rainy season had not yet begun, so roads were mostly navigable and the respondents were not too busy with farm activities. The interviews were conducted by the author and a translator. The farmers of Baybay speak Cebuano, also called Visayan, and although English is taught in schools most respondents have only basic education and thus preferred using their native Cebuano for the interviews. Interestingly, a few of the oldest respondents who were school age children during the US occupation had maintained their

English fluency over the years and were eager to be interviewed by an American. The enthusiasm of these farmers and their use of outdated American colloquialisms in such an exotic location made for very entertaining interviews.

5.3 Data Analysis

Upon completion of the 100 household interviews the data was entered and cleaned. Data cleaning was an arduous process as units of measurement had to be standardized (minutes walking into kilometers, jute sacks into kilograms, etc.) and information had to be corroborated (particularly the reports of the number of coconut trees with the hectares of coconut land and amount of copra sold). All statistical analysis was then performed with the program STATA Special Edition 11.0.

As stated in the previous section, the three quantitative research questions are about the difference in yield, price received, and income from copra between the partnership farmers and the non-partnership farmers. These three points of interest are represented by five outcome variables: "ykghacoco", the annual copra yield in kilograms per hectare of productive coconut land; "ykgtree", the annual copra yield in kilograms per productive coconut tree; "price", the price in PhP[5] per kilogram that the farmer received for his copra after the most recent harvest; "gmhh", the annual copra gross margin in PhP per household member; and "gmperha", the annual copra gross margin in PhP per hectare of productive coconut land.

There are two outcome variables to indicate yield because throughout the interviews it became evident that farmers were not confident in their estimates of either how many hectares of coconut land they farm or how many coconut trees they have, or both. Furthermore, because of the very basic farming techniques used, the number of trees in one hectare of coconut land varies wildly between farmers, and this in turn affects yield. It is recommended by most guides that coconut trees, as a monocrop, be planted eight to ten meters apart in a triangular pattern to maximize yield (Chan and Elevitch, 2006; TNAU Agritech Portal, 2008). As the respondents leave their coconuts to reproduce haphazardly, this expected

[5] The Philippine peso is the official currency of the Philippines. 100 centavos make up a peso, which is worth 0.019 Euros or 0.024 USD (October 7, 2012, xe.com).

number of trees per hectare is unrealistic, as is the related copra yield. In many cases, a higher number of trees is in fact correlated to a lower yield as farmers had let their plots grow too wild and the competition for resources among coconut plants was a detriment to nut production. This is evidenced in the fact that the average copra yield of respondents, about 800 kg/ha, is significantly lower than the what is expected in the Philippines under organic conditions, 1,230 kg/ha (Magat and Canja, 2009). As mentioned above, this problem of unreliable number of hectares and trees reporting was handled during the data cleaning stage, but to err on the side of caution both units were included in the final analysis.

There were no such issues with the price variable as all respondents knew at what price they sold their copra after the last harvest; the accuracy of the recall is not doubted because post-harvest sales take place three to four times a year. Ideally, an average annual price would be calculated to match the annual yield and annual gross margin figures, but due to the low literacy rates among coconut farmers and their lack of bookkeeping this was not possible. This is unfortunate because it would be interesting to see how the farmers are affected by the world market price and because farmers do not all sell at the same point in time so their price received could vary by a few pesos. With no other options available, this weakness in the data had to be overlooked but it should be noted that with the respondents' income levels as low as they are, even a very slight change in the copra price could have major repercussions on the households' well-being.

The outcome variable for the annual copra gross margin was originally only calculated as per hectare of coconut farm land, but that proved to be too closely linked to farm size, so the per household member variable was added in order to be more indicative of the home economic welfare. In calculating the gross margins there was no need to take material costs into account as the respondents practice very crude farming methods. There are no seedlings purchased or planted, instead the occasional fallen coconut goes unnoticed and is left to grow into a new tree; this is evident in the complete lack of plant organization, the untrained eye would see a wild jungle where actually coconuts are being cultivated. If any weeding is done it is by hand, so there is no need for tools, and the hired harvesters are responsible for bringing their own bolos or machetes. Also there are no fertilizer inputs because the application of

fertilizer has not yet been adopted in the area; farmers are unconvinced of the effect on yield that fertilizer application may have, and regardless most of them could not afford to buy it. Thus, the costs considered in the gross margin calculation are the labor costs for weeding, harvesting, processing, and marketing as well as the costs for transporting the copra to the buyer.

Twelve household characteristics were included as variables in an effort to discern the average profile of a partnership farmer from that of a non-partnership farmer. These were important for both the descriptive statistics and the propensity score matching process. The household characteristic variables included: “sex”, a dummy variable for the gender of the household head; “age”, the age of the household head; “educ”, the number of years the household head had received formal education; “hhsize”, the number of individuals in the household; “deprat”, the dependency ratio of the household; “hafarm”, the total number of hectares farmed by the household; “coco_share”, the percentage of total farmed hectares with productive coconut plants; “yrsexp”, years of household experience farming coconuts; “remit”, a dummy variable for whether the household receives remittances or not; “nr_inc”, the number of income sources that the household has; “km”, the distance from the SC Global processing plant in kilometers; and “org”, a dummy variable for membership in an organization (farmer’s group, cooperative, political party, women’s organization, etc.), which could be seen as social capital and thus a contributor to higher household income. Here again, the variables related to hectares and number of trees may be flawed due to unreliable reporting by farmers, but the inconsistencies were corrected as best as possible during the data cleaning phase.

Care was taken to ensure that these 12 household characteristic variables are exogenous and not affected by a household’s decision to participate. The two variables “hafarm” and “coco_share” could be construed as endogenous, but in fact in this particular case they are not. One might think that a farmer having joined the partnership and reaped the benefits of membership may choose to expand the size of his farm, or increase the share of his land dedicated to coconut production; if this were true “hafarm” and “coco_share” would be endogenous. However, given the facts that expansion of farmland is impossible, and adjustment of coconut cultivating area is simply not done, the two variables are exogenous and

therefore fit for inclusion. Farmers are unable to expand their farmland because arable land (that is not protected rainforest land) in the area is limited, and land tenure laws are complex and widely misinterpreted. Farmers also do not adjust the portion of their land that they dedicate to coconut production. This is because they are not really in control of their coconut plots; they allow the trees to reproduce naturally, and their cultivation methods cannot be considered part of a planned farming system. Furthermore, even if the two variables in question were endogenous, they would only be so in the long term. Coconut cultivation, as is the case for most tree crops, is a slow process. Expansion of coconut area or share would only take effect after 10 years when the trees first bear fruit. SC Global launched its partnership farming program in 2006, so all analysis here is for the short term.

Other questions in the interviews yielded information about the livelihoods and lifestyles of the region's smallholder coconut farmers, but the 12 household characteristic variables do more than that, they are the basis for the propensity score matching.

5.4 Propensity Score Matching

Because the coconut farmers are free to choose whether or not they enter the partnership farming arrangement with SC Global, it is interesting to look at which of the 12 household characteristics determine the probability that a farmer will do so. Additionally, each respondent can only choose one option, to enter the partnership or not, they cannot choose to be in both the treatment and the control group. This leads to the question of what effect on the outcome variables (yield, price, gross margin) does a farmer's entrance decision have. This can be represented in the following treatment effect formula: $\tau_i = Y_i(1) - Y_i(0)$, where Y_i is the decision to enter the partnership or not. Work by A. Roy (1951) and D.B. Rubin (1974) further discuss the model of potential outcome and causal effects.

In practice, the treatment effect formula provides only for the partnership decision that the farmer made, and cannot evaluate the hypothetical partnership decision that the farmer did not actually make (Rosenbaum and Rubin, 1983). In effect there is missing data, an issue that needs to be overcome using the average treatment effect on the treated (ATT) (see

Heckman, 1979), which evaluates the difference between the expected outcomes of treatment and non-treatment for those respondents who did choose to enter the partnership:

$$\tau_{ATT} = E(\tau|d = 1) = E[Y(1) - Y(0)|d = 1]$$

The unobserved outcome of the non-treatment among households that are in fact treated ($E[Y(0)|d = 1]$) is estimated by substituting the mean outcome of the non-partnership farmers, ($E[Y(0)|d = 0]$) (Loos, 2011).

All respondents are well aware of the existence of SC Global and its partnership arrangement and are free to enter the program provided that they meet the organic standards. Because of the rudimentary farming style of the area, all respondents are organic by default, so this prerequisite is never a barrier to entrance. This means that the partnership farmers, through self-selection, have entered themselves into the treatment group. There are most likely factors that influence this self-selection, and these factors possibly influence the outcomes of yield, price and gross margin as well. This means that replacing the unobserved counterfactual mean ($E[Y(0)|d = 1]$) with the mean outcome of the untreated households ($E[Y(0)|d = 0]$) is not an adequate substitute; there is a "selection bias" (Loos, 2011; Heckman, 1979).

The issue of selection bias can be minimized by using propensity score matching. Through the matching of pre-treatment observed variables the propensity score matching method also removes much of the limitation caused by a finite sample size (Chen and Zeiser, 2008). Loos in his paper, "To Sell or Not to Sell: Maasai Milk Marketing in Ngerengere, Tanzania" (2011), introduces the concept of propensity score matching best:

> "The core principle is to match participants to non-participants with a similar vector of observed pre-treatment characteristics. Provided that treatment assignment is strongly ignorable, Rosenbaum and Rubin (1983) show that the propensity score, i.e. the conditional probability of assignment to a certain treatment: $p(X) = \Pr(d = 1|X)$, is a suitable single-index balancing score to find matching partners. Strong ignorability comprises two central assumptions. First, the conditional independence assumption (CIA) states that for a given set of observable covariates, participation assignment is independent of potential outcomes (Caliendo and Kopeinig, 2008). Second, there needs to be a region of common support. Within this overlap, households with the same characteristics have a positive probability of being both

> participant and nonparticipant [(Heckman, Ichimura & Todd, 1998)]. These assumptions may be somewhat weakened, if focusing on the ATT only (Caliendo and Kopeinig, 2008), and/or generalized, if considering multiple treatment scenarios [(Imbens, 2000; Lechner, 2001)]."

The second assumption, the region of common support requirement is met, as shown later in the results section. The first assumption, the CIA, in this case is not perfectly met. The propensity score matching is not immune to hidden bias, because there are unobserved and omitted variables that influence the partnership decision as well as possibly the outcome variables. The most prominent of the omitted influences is how SC Global decides which villages to enter and to which households to offer organic certification and partnership inclusion. Some barangays contained no partnership farmers, while others were home to an overwhelming majority of participating farmers. The captains of those villages without any treated farmers said that SC Global had not yet come to their barangay to promote the program and recruit members. It is debatable whether the self-selection of entrance into the program can even be labeled as such. Throughout the interviews it became evident that the farmers who joined the partnership were those who just so happened to be at home the day SC Global recruiters came to their barangay. Because these low-income and under-educated farmers are easily convinced by the recruiters' promises and promotional materials (baseball hats and t-shirts with the SC Global logo), the entrance decision can hardly be described as self-selection. This is evident in the fact that none of the non-partnership farmers had been approached with the offer of membership by an SC Global representative. But because no farmers were forced to enter the program, they all had the option to abstain, and for the purpose of this statistical analysis, the term self-selection will be considered valid.

Both the Loos (2011) paper and a widely referenced paper by Caliendo and Kopeinig (2008) were used as guides for the implementation of propensity score matching. First the propensity score, that is the conditional probability that a household will be in the treatment group, was achieved by running a univariate probit model on the 12 household characteristic variables. Then the predictive power of the model was calculated. As described by Caliendo and Kopeinig (2008), there is a variety of matching techniques available. Each technique establishes a maximum propensity score distance, or caliper, and each technique strikes a different balance between bias reduction and efficiency, or variance. For this analysis, the

radius matching technique of Dehejia and Whaba (2002) was employed, whereby all neighbors within a predetermined caliper are used. Loos (2011) and Caliendo and Kopeinig (2008) report that this improves matching quality by allowing for the use of more units when good matches are available, and fewer units when good matches are not available. To calculate the caliper within which neighbors can be drawn for matches, the technique recommended by Rosenbaum and Ruben (1985) was used: the caliper (c) is equal to a quarter of the standard deviation (sd) of the logistic model of the propensity score ($c = 0.25 * sd$).

6. Data and Descriptive Statistics

The data collected paints an interesting picture of the average coconut farmer in the Baybay area. He or she is 59.8 years of age, which is considerably older than the author anticipated given that coconut harvesting is a dangerous activity, but the reality is that little labor is required for coconut cultivation and when it is harvesting time young men are hired to climb the trees. This also speaks to the labor market of the Philippines: youth often seek work in urban areas or abroad and send money home to their extended family. During the household interviews the topic of remittances seemed to be a slightly sensitive one. Some respondents were reluctant to say whether or not they receive money from family members in other places, so although the data shows that 40% of households collect remittances it is suspected that the actual percentage is higher.

The statistics on the gender of the household head are unreliable and should not be used in any interpretations. It was endeavored to interview always the household head during the field study, but this proved to be a challenge because of loosely defined gender roles. With several income sources contributing to the household budget it is often unclear who the main breadwinner is. When asked to interview the head of the household many male farmers would direct the translator to his wife and make a joke about how she runs the home, but then perhaps she would not be able to answer questions about copra production. And in other cases the man would declare himself the household head but would have to pass the copra production questions to his wife for answering. The interviews became more amusing, but less reliable, when couples would argue over how best to answer questions. This lack of clarity regarding what makes a person the household head means that the three variables pertaining to the household head (sex, age and education level) should not be interpreted in a strict sense. Whether the male or female was the household head, the couples generally had similar education levels and were close in age.

The average coconut farming household has 4.69 members, with a dependency ratio of 1.62. This ratio seems quite healthy and does not indicate that children are quitting school to contribute to household income, and yet the average number of years spent in formal

education is only 7.32, or when a child reaches approximately 12 years of age. Perhaps school fees or another unobserved variable is the reason for the early drop outs.

In keeping with the aim of this research, to evaluate the effects of partnership farming on smallholder farmers, all respondents have just a small amount of land. Two respondents (households #25 and #76) did not know how many hectares of coconut they farm and six (households #22, #46, #50, #52, #57 and #72) did not know how many productive trees they have, so estimates were made based on their reported yields. The average number of hectares farmed is 2.12. But when eight extreme outliers (due to very unreliable hectare and number of trees reports, as well as two respondents who are much better off than their neighbors because they were chosen to be SC Global ACPs) are excluded from the calculation, the mean is 1.63 ha. Excluding those same outliers does not make much of a difference in the calculation for the share of land farmed with productive coconuts variable. The percentage is 83.30 with the exclusions, and 81.73% without the exclusion. From these numbers one can see that farmers only use about half their land for copra, the rest is usually for rice, root crops, livestock, fruit trees, vegetables, and some maize. These other land uses are extra income sources, additionally farmers can be involved in labor, handicrafts, vending, contractual work, welding, upcycling, and transportation. The average number of income sources per household is three.

As mentioned earlier, the sampling procedure allowed for selection of households with similar infrastructural and geographic endowments. The barangays are quite near to the SC Global production facility, an average of 5.58km away, and the standard deviation is quite low, just 2.42km.

In terms of social capital, the coconut farmers seem on the surface to be doing well, with 62% membership in organizations. But the fact that market information is so scarce, and there is no organization of farmers into cooperatives with bargaining power or their own value chain, means that they are not taking advantage of the social capital available to them. This will be discussed in greater detail in the qualitative results section.

Of the 100 respondents, 52 were non-partnership farmers (in the control group), and 48 were members of the SC Global partnership (treatment group). Table 1 shows the results of t-tests on the differences in outcome variables and household characteristic variables between

treated and untreated respondents. Of the 12 household characteristic variables, only five had a statistically significant difference between treated and control group farmers. Partnership farmers are better educated, have a lower household dependency ratio, have more farm land, have a higher share of coconut land, and have more sources of income.

Table 1: Differences in partnership and non-partnership farmer characteristics included in the probit model

	Mean Values	
	Non-Partnership (N=52)	Partnership (N=48)
Dependent Variables		
Copra yield per ha of coconut land (kg)	830.63	767.27
Copra yield per productive coconut tree (kg)	6.67	5.89
Copra price per kilogram (PhP)	25.09	25.17
Copra gross margin per household member (PhP)	1601.66***	4254.27***
Copra gross margin per ha of coconut land (PhP)	8028.78**	13654.06**
Independent Variables		
Dummy for gender	0.4	0.31
Age	59	60.67
Education level (years)	6.79*	7.89*
Household size	4.5	4.7
Dependency ratio	1.8**	1.24**
Total hectares farmed	1.33**	1.96**
Share of farm land with productive coconuts	0.74***	0.97***
Years of experience farming coconuts	31.04	30.5
Dummy for receiving remittances	0.38	0.42
Number of income sources	2.74**	3.07**
Distance to the SC Global facility (km)	5.6	5.55
Dummy for membership in an organization	0.62	0.63

* Indicates significant differences at α=0.10 between treated and control groups

** Indicates significant differences at α=0.05 between treated and control groups

*** Indicates significant differences at α=0.001 between treated and control groups

Of the outcome variable means, there is only a statistically significant difference between treated and control group farmers for the two gross margin variables. Because eight outliers were excluded from the outcome variable group means calculations in order to have normal distributions for the parametric t-tests, non-parametric tests were needed to confirm the results. With the Mann-Whitney test the outcome variables yield per coconut hectare, yield per tree, price, and gross margin per hectare yielded insignificant results, but the gross

margin per household member variable has significantly different (at α=0.001) medians for the treatment and control group. It appears that with respect to gross margin per household member, partnership farming households are better off than their untreated counterparts, however simply comparing the mean and median differences does not consider self-selection into the program and the resulting bias. Systematic differences between the treated and untreated may exist, and would need to be taken into account through the propensity score matching method. The household characteristic variables that were used for the probit modeling portion of the propensity score matching were chosen because (based on economic theory and observations during field work) they are predicted to affect both the program participation decision and the outcome variables simultaneously. This dual effect is a requirement of propensity score matching (Smith and Todd, 2005), so too is the rule that variables included in the probit model should not be affected by program participation (Caliendo and Kopeinig, 2008).

7. Quantitative Results

This section reports the quantitative results and summarizes them in terms of the research questions and hypotheses.

7.1 Propensity Score Results

Following the steps as described in the methodology section, the propensity score matching was implemented and the empirical results emerged. First, a univariate probit model was run to see which household characteristic variables are predictors of participation. The results of the probit model are shown in Table 2. The chi-squared value of 36.46 and the p-value of 0.0003 show that the model as a whole is statistically significant and fits significantly better than a model without predictors. The variables that are statistically significant as participation indicators are the age of the household head, the household size, the dependency ratio, the number of hectares farmed, the share of farmland cropped with coconuts, and the number of income sources that a household has.

A subsequent command in STATA revealed the marginal effects of those six variables (in terms of absolute change starting at the variable's mean and keeping all other explanatory variables constant): with one additional year of age of the household head the probability of participation increases by 1.12 percentage points; with one additional household member the probability of participation increases by 6.47 percentage points; with an increase in the dependency ratio by one percentage point the probability of participation decreases by 9.61 percentage points; with one additional hectare of farmland the probability of participation increases by 5.82 percentage points; with an increase in the share of coconut land by one percentage point the probability of participation increases by 1.19 percentage points; and with one additional source of income the probability increases by 15.32 percentage points. The marginal effect of the hectare of farmland variable is not remarkable because the farmers are smallholders and the addition of one hectare of farmland is unlikely. When the outliers were excluded the average respondent had just 1.63 hectares of farmland, and the standard deviation was 1.11. The coconut share marginal effect is negligible, but shows that farmers

who are more dedicated to coconut cultivation are more likely to join the partnership. The relatively high marginal effect of the income sources variable is interesting and unexpected. One would think that fewer income sources, or being more focused on coconut cultivation, would increase the likelihood of participation. Here this is not the case, and could be due to the fact that those farmers with few income options are the poorest and most marginalized. Farmers with more income sources could be more business-minded, have stronger social ties, and be willing to take on the risk of participation. If this is true, it means that partnership farming does not provide poverty relief to the poorest of the poor.

Gender, education level, and years of experience coconut farming were close to being indicators, but were above the threshold (α=0.10) for statistical significance.

A logistic model was run to confirm the indicator variables. The results, as shown in Table A7 of the Appendix, do indeed confirm the indicator variables, although less leniently, as is to be expected with a logistic model.

Table 2: Univariate probit model showing household characteristic variables as predictors of participation

Probit regression	Number of obs = 100
	LR chi2 (11) = 36.46
	Prob > chi2 = 0.0003
Log likelihood = -51.003802	Pseudo R2 = 0.2633

Participation in partnership	Coefficient	Standard Error	z	P>|z|
Dummy for gender	-0.490	0.329	-1.490	0.137
Age	0.028	0.016	1.750	0.080
Education level (years)	0.080	0.053	1.500	0.133
Household size	0.163	0.096	1.710	0.088
Dependency ratio	-0.242	0.145	-1.680	0.094
Total hectares farmed	0.147	0.074	1.990	0.047
Share of farm land with productive coconuts	3.000	0.769	3.900	0.000
Years of experience farming coconuts	-0.015	0.010	-1.480	0.139
Dummy for receiving remittances	-0.289	0.373	-0.770	0.439
Number of income sources	0.386	0.187	2.070	0.039
Distance to the SC Global facility (km)	-0.049	0.079	-0.610	0.539
Dummy for membership in an organization	0.044	0.332	0.130	0.894
Constant	-5.690	1.530	-3.710	0.000

The next step in the statistical analysis was to calculate the propensity score, which is the probability of participation. Farmers in the control group have a 33% probability of

participation, and treated farmers have a 64% probability of participation. To see how strong these probability estimates are the predictive power of the model was calculated, the results of which are in Table 3. Of the control group farmers 73% are correctly predicted as non-participants, and 73% of treated farmers are correctly predicted as participants. This shows strong predictive power of the model.

Table 3: Predictive power of the propensity score model

	Control Group	Treatment Group	Total
Prediction			
Non-partnership farmer			
(frequency)	38	13	51
(percentage)	73.08	27.08	51.00
Partnership farmer			
(frequency)	14	35	49
(percentage)	26.92	72.92	49.00
Total			
(frequency)	52	48	100
(percentage)	100.00	100.00	100.00

The next step was to calculate the caliper width which determines the area of common support for the radius matching technique. The caliper was defined as one-fourth of the standard deviation of the propensity score: $c = 0.25 * sd = 0.0707456$. Figure 2 shows the distribution of the propensity score and the area of common support. The cases labeled "off support" are those that were omitted from the analyses in order to achieve good matches.

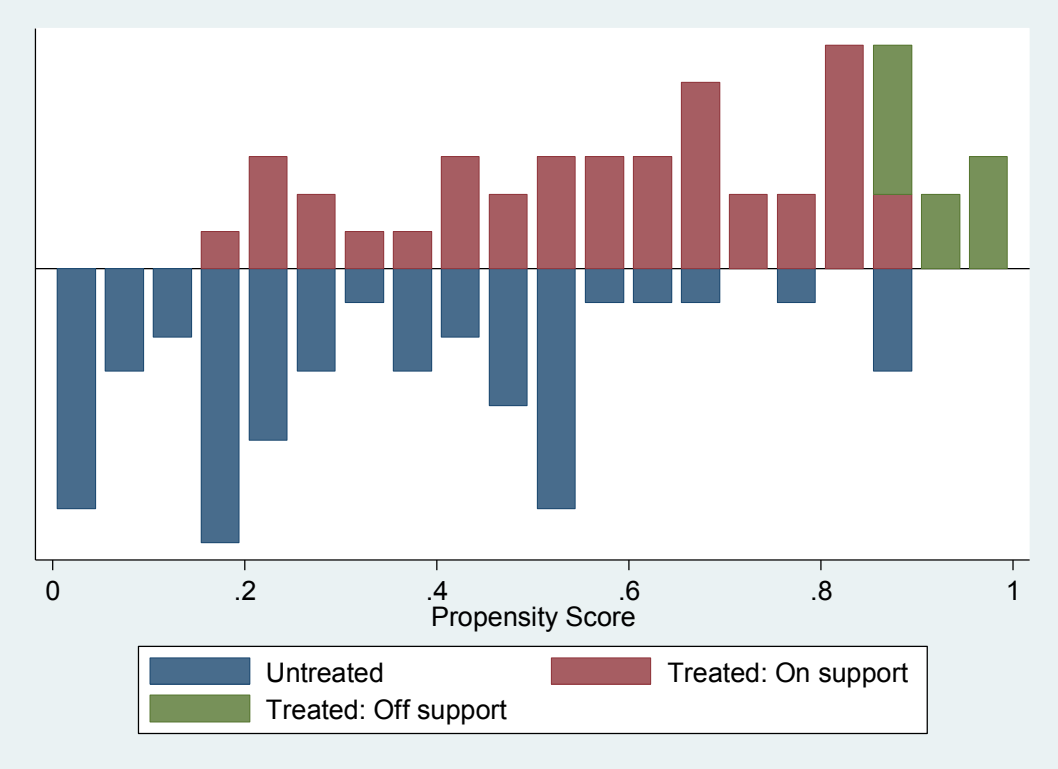

Figure 2: Distribution of propensity score and common support area. Source: Own calculation using *psgraph*.

Using the caliper and the five outcome variables (yield per hectare of coconut land, yield per coconut tree, price per kilogram, gross margin per household member, and gross margin per hectare of coconut land) the matching procedure was performed. This produced the unmatched and matched ATT values shown in Table 4. There are 9 cases that are off support, all of which are from the treatment group. When unmatched, being a partnership farmer significantly increases the gross margin per household member (by 3713.32 PhP). However, when selection bias is reduced by propensity score matching, the ATT for gross margin is insignificant. This is true for all other matched outcome variables leading to the conclusion that there are no benefits to yield, price, or copra gross margin to be gained by joining this particular partnership program. The insignificance of the ATT results is confirmed by the high bootstrap p-values for all five outcome variables: yield per hectare of coconut land (0.68), yield per coconut tree (0.40), price received per kilogram (0.73), copra gross margin per household member (0.58), and copra gross margin per hectare of coconut land (0.81).

Table 4: Average outcome variable effects

Outcome variable		ATT	Standard error	T-statistic
Yield per hectare of coconut land (kg)				
	Unmatched	-349.72	278.34	-1.26
	Matched	-66.77	182.77	-0.37
Yield per productive coconut tree (kg)				
	Unmatched	-1.21	1.25	-0.97
	Matched	-0.95	1.77	-0.54
Price per kilogram (PhP)				
	Unmatched	-0.12	0.73	-0.16
	Matched	0.32	0.93	0.35
Copra gross margin per household member (PhP)				
	Unmatched	3713.32	2189.07	1.70
	Matched	1047.79	2636.46	0.40
Copra gross margin per hectare of coconut (PhP)				
	Unmatched	-2773.32	6201.86	-0.45
	Matched	1250.43	4605.50	0.27

Nine cases off support
Source: Own calculation using *psmatch2* (Leuven and Sianesi, 2003)

A pstest in STATA was performed for quality control, revealing that the residual bias is 12.0%. That remaining standardized bias is above 5%, and is not within the tolerance level (Caliendo and Kopeinig, 2008). This suggests that there are other sources of bias for which the propensity score with the given variables cannot account for. There could be a variable influencing self-selection that was overlooked or selection bias when SC Global recruits households.

7.2 Quantitative Results Summary

To summarize the quantitative results in terms of the hypotheses, after propensity score matching Hypotheses 1, 2, and 3 were disproven. These hypotheses turned out to be false mainly because SC Global was not providing all the partnership benefits that it claims to. SC Global's role will be further discussed in the qualitative results section. Hypothesis 1 was that treated farmers would have a higher yield per hectare than control group farmers. According to the propensity score matching, the ATT for yield of copra per hectare of coconut land is -66.77, and this number is statistically insignificant. Because of the unconvincing reports by farmers about how much coconut land they farm, the yield was also measured in kilograms per

productive coconut tree. The propensity score matching for that outcome variable confirmed the negative and statistically insignificant ATT results for yield. Originally, it was thought that the treatment group would have higher yields because of the extension services offered by SC Global, but it was discovered during the interviews that farmer training sessions are few and far between.

Hypothesis 2 was that partnership farmers would receive a higher price per kilogram than non-partnership farmers. This is not the case, the propensity score matching shows a very slight positive price difference as the matched ATT, but it is statistically insignificant. The price was expected to be higher for the treatment group because of SC Global's claims that it offers competitive prices and that the absence of a middleman would provide farmers with a higher farm gate price. In actuality, SC Global's ACPs play the same role as middleman and siphon off profits where they can. Furthermore, it was anticipated that SC Global's annual supply-based cash incentive would need to be factored into the price per kilogram and this would increase the ATT, but farmers reported receiving either a miniscule cash bonus or none at all.

Hypothesis 3 stated that as a result of the expected higher yields and higher prices treatment group gross margins from copra would be greater than those of the control group. It was expected that partnership farmers, because of the organic rules prohibiting the use of conventional inputs, would have lower material costs, thus contributing to a higher gross margin. This did not turn out to be the case as all coconut farmers in the area are organic by default; their very basic cultivation technique does not include the use of inputs.

8. Qualitative Results

This section gives the qualitative results, which were not derived using traditional qualitative analysis techniques, but rather are an overview of responses from the qualitative segment of the questionnaires, observations from household visits, and a summary of respondents' unsolicited commentary.

8.1 Results from the Qualitative Segment of the Questionnaires

The fourth main research question was: To what extent do coconut growers suffer the risks and reap the benefits of participating in partnership farming? Hypothesis 4 states that although the partnership farmers may suffer some of the risks, because they are rational individuals they would not continue to participate if the benefits did not outweigh the risks, or at least break even. In the case of SC Global, the partnership arrangement's benefits would far outweigh its risks if the company were actually following through on its promises. Unfortunately, the respondents reported that this is generally not the case.

Under-valuing of copra and dependency on a cash crop were predicted as the primary risks of involvement in this partnership program. The respondents reported that under-valuing or unfair copra evaluation methods were not an issue. SC Global has a transparent copra grading system that involves measuring the water content with a computerized probe. There is an established pricing scale according to water content, which farmers are familiar with and willing to accept. The fact that farmers and SC Global alike are content with the copra grading system is positive, but irrelevant because only eight respondents reported having their copra graded. The other 40 partnership farmers sell their copra *pasa* to either an ACP or a middleman who sells on to an ACP[6]. As explained earlier, selling *pasa* means that the buyer gives a lower price for ungraded copra and then assumes the risk of drying it and reducing it to an acceptable water content level before selling it on to the processor. It is exactly this middle step that partnership farming would ideally eliminate.

[6] This possibility of farmers selling to a middleman who then sells on to an ACP suggests a link in the supply chain that is untraceable, and thus calls into question the organic quality of the final product.

Dependency by smallholder farmers on a cash crop is also a major concern about partnership farming. Copra price fluctuations based on the world market have a large impact on Baybay's poor coconut farmers because of their reliance on the crop. This in turn affects household food security. A graph of the world market copra price over the last five years can be seen in Figure A2 of the Appendix. When asked to what extent the market price fluctuation of copra affected their household's income, all 48 partnership farmers gave the effect the highest score of ten. Because the farmers survive off of so little, even the slightest price dip will affect their quality of life. And, as seen in the quantitative results section, the average respondent has only three sources of income; there is not much to buffer a fall in copra price. Originally, SC Global had planned to promote the intercropping of banana in Baybay, but they ended up moving that project further south to Matalom. Banana cultivation would mollify the risk of depending on the one cash crop, so respondents were disappointed that they had not been included in the intercropping plan.

Benefits expected of partnership farming include: better market access; lower operational risk, due to assured prices and markets; higher and safer returns to investment; and loans in kind, usually as inputs, like fertilizer or seeds, and technical advice.

All 100 farmers agreed that market access was not an issue; if they had copra to sell there was always someone nearby willing and able to buy it from them. There was no difference in ease of market access or steady demand between the treatment and control groups. This relates to the operational risk, in that markets are naturally assured, and assured prices are not a factor, because, unlike contract farming, in partnership farming the prices are not pre-determined. All 48 treated farmers said that since entering the program they experienced neither more nor less risk with their coconut cultivation.

Returns to investment could not be tested as a benefit of the program because no farmers made any investments in their coconuts. Because of the basic farming techniques there are no special tools or inputs to invest in, and they would not be affordable anyway. The farmers are mostly limited to the land that they have, cropping area expansion does not seem to be an option due to the farmers' lack of savings and the land tenure schemes of the region. Land tenure in the area is complex and political; it is neither understood nor trusted by

smallholder farmers. This could be another reason that farmers are reluctant to invest in their land.

As far as loans in kind, of fertilizer or seeds, this also could not be assessed because SC Global's agreement does not include them. Extension service is also common in partnership farming and in this case the technical advice is offered free of charge and is part of the organic certification process. In the first interview with Mr. Licup, he said that once every year farmers are given mandatory training, and individual farmers may ask for additional technical support throughout the year, especially during the field inspections. When the farmers were asked if they had actually received this annual training only five reported that they had, six said they had been trained once in the past two years, and 36 said they had not been trained at all. This is a disappointment for the farmers who are interested in learning how to increase their yield, but also a danger for SC Global as it is putting its organic certification at risk by not properly training its farmers.

Because of the varying nature of partnership farming agreements, benefits are particular to each program. SC Global says that they give their farmers cash incentives based on each farmer's annual supply and competitive prices. The promise of cash incentives turned out to be another disappointment for participating farmers. Only two farmers reported receiving an end of year cash incentive of more than 150 PhP, seven said they received between 50 and 150 PhP, 12 farmers were given less than 50 PhP, and the remaining 27 farmers received none. Wondering why the incentives are so small or non-existent the author assumed that somewhere in the organization undeserving individuals are pocketing the money. In the follow-up interview with Mr. Licup the question of who distributes the incentives was raised. Mr. Licup first reacted by avoiding the question, then when asked a second time he said that the field technicians distribute the incentives and the process is controlled with a voucher system. Mr. Licup did not know that the author had posed the same question to his assistant manager before he had entered the room, and gotten a more plausible answer. After pressing Mr. Licup on the issue he finally admitted that it is in fact the ACPs themselves who distribute the cash incentives and that the process is not monitored at all. The author found this exchange interesting and wondered if she would have to ask all questions three times in order

to get a straight answer; the occurrence also called into question Mr. Licup's motives. Because each ACP is one individual acting as a middleman, there is little reason for the ACPs to pass on the incentives to their suppliers. They can pocket it without SC Global knowing or caring, and because the farmers do not know how much cash to expect at the end of the year they are powerless to demand it. If SC Global were concerned about getting the incentives to the rightful recipients they would have a voucher system in place.

A similar problem, hinging on the involvement of the ACPs is occurring with the copra pricing. Only six respondents reported receiving a higher price than before entering the program, and the average reported price increase was 0.96 PhP/kg. This is because here too the ACPs are keeping extra money to themselves. Every day, according to the market price fluctuation of copra in Davao (a major commodities trading city in Mindanao), SC Global tells its ACPs the highest price that they may offer suppliers. The ACPs are then at liberty to decide at what price to sell. So although SC Global may say that it is offering competitive prices, it is not enforcing those prices, and the ACPs pocket the difference. Ultimately this defeats much of the purpose of partnership farming; the farmers do not benefit from the absence of a middleman because the ACPs are fulfilling that profit consuming role. Here again, if SC Global were truly interested in offering higher prices to its farmers, they would find a way. The daily price could be posted publicly at each ACP, or it could be announced on the radio, or because of the popularity of cell phones in the area, text messages could be sent to village heads.

When partnership farming is implemented as a rural development tool it is hoped that it will have a positive impact of households' standards of living. In this research that was not the case. All respondents reported that their household income had not changed since entering the partnership, and none reported any changes in standard of living indicators (food security, home improvements, income diversification, education, free time). This leads one to wonder why a farmer would join the partnership and at what cost. As mentioned before, the self-selection into the group is mainly based on the chance that the farmer was at home the day the SC Global recruiters came to promote in their village. Thirty-five respondents said they joined because they were convinced by the recruiter's promotion materials, and a handful joined because they did not want to be different from their neighbors. The cost of entrance into the

program was negligible or zero for all farmers; it is free to enter the program and since most farmers in the area are organic by default, no respondents had to invest in farm conversions. When asked about how their welfare in general had changed since entering the partnership, all farmers reported no change. Despite the lack of benefits from entering the SC Global program, 23 respondents said they would recommend joining the partnership to a neighbor.

8.2 Unsolicited Results

The portions of the questionnaires that were left open for unguided commentary reveal several unforeseen aspects of partnership farming and the copra business to include the need for loans, the role of loyalty in the supply chain, a preference for payment in the form of cash, the locals' value of time, issues with forming cooperatives, the lack of understanding of the organic premium and the brontispa[7] problem.

Among the respondents, the availability of loans is an important factor in determining to whom to sell copra. The smallholder farmers do not have enough savings to be able to pay for the labor when it is time to harvest. For this reason they need loans, which are never formal bank loans but usually take the form of advance payment from middlemen for copra. Some households also need loans to meet their basic consumption needs. Thirteen of the treatment group respondents said they would like for SC Global to offer loans or advance payment. Some ACPs offer loans independently to meet this demand. For those who need loans a strong relationship with a middleman is a must. Trust is forged between the buyer and seller over the years and a sense of loyalty develops. When asked why they sell to a particular middleman, several farmers replied simply because they always have.

Another issue is what form payment takes. Smallholder farmers prefer to be paid in cash rather than by check. Firms like SC Global often choose to pay with checks in order to prevent fraud, and also to protect farmers from robbery upon leaving the point of sale. Farmers would like to be paid in cash because going to a bank to cash a check not only because it costs money to go to the bank but also because of social distance issues. Farmers can feel

[7] Brontispa longissima, or coconut leaf beetle, has recently arrived in the Philippines from other Pacific islands. The pest feeds on young coconut leaves, resulting in sickly trees with diminished yields. Brontispa can be controlled with pesticides or biological agents like parasitoids.

uncomfortable going into a bank where everyone is dressed formally, there are armed guards, and the building is modern and intimidating. Add to this the fact that many farmers have weak reading skills, no bank account, and no identification card with which to cash the check, and a trip to the bank becomes impossible. Mr. Licup is aware of these issues and has answered them with the policy that sales of less than 1,000 PhP will be paid in cash, and anything more will be paid by check.

Surprising to the author was the respondents' value of time as it relates to money. Farmers are permitted to bring their copra directly to the processing facility in Caridad and have it graded and purchased on site. This would seem like an attractive option, especially for those living nearby. The transport cost of carrying a few sacks down the road would be negligible, and by cutting out the middleman they could get a higher price. When asked about it, a handful of farmers said they do not supply directly to the factory because the grading process takes too long. They reported that entering the facility, having the water content measured and receiving payment takes about 45 minutes, and they think that is far too long. For farmers that appear to be unoccupied for much of the day, this complaint seems unreasonable. Another bizarre reason for not supplying directly to the factory is the destruction of the jute sacks that the copra is carried in. Four farmers reported that when the SC Global workers grade the copra they simply stab the water content measuring probe into the jute sacks, putting substantial holes in the sacks. The author asked these farmers how much a jute sack costs, and how much higher of a price they could expect to get per sack of copra, and they agreed that it was still economically advantageous to sell the copra at the factory, but they were unwilling to have their jute sacks destroyed and so would sell elsewhere, even if it means getting the low *pasa* price.

It was disappointing to discover the lack of effective cooperatives in the area and the fact that farmers are not taking advantage of the social capital available to them. Thirty-three of the 100 respondents are members of a cooperative or farmers' organization, but their membership does not seem to impact the price they receive or their access to high value markets. As discussed earlier, farmers are not convinced of the potential a cooperative has to improve their livelihoods, they lack the commitment and enthusiasm necessary for a successful

cooperative, they do not hire professional managers, and they are unwilling or unable to make temporary sacrifices for their future good. It could also be that there are just so many coconut farmers in the area that a cooperative would have difficulty harnessing bargaining power. Even if 100 farmers banded together into a highly motivated, professionally managed cooperative, they would still only represent about 140 ha of coconut land. A large processor like SC Global could easily ignore the demands of the cooperative and supply their coconuts from a bit further away at no real cost to the company. During the field research all of these roadblocks to successful cooperatives were brought up by respondents.

Related to the failure of cooperatives and the poor information transmission through communities, is the lack of understanding about the organic premium. Because coconut farmers in the area are organic by default, and only wealthy owners of large plots of land can afford to use conventional inputs, they do not see the value of their organic certificates. About a third of the respondents do not know that they have an organic certificate because their village head keeps the certificates for them. Several respondents laughed in disbelief that their "poorly grown" coconuts fetch a higher price on the international market because of the demand for organically grown food. Clearly, the farmers lack the information and market insight to assert their bargaining power.

As previously mentioned, the respondents are interested in receiving more technical training, and this is especially true now that brontispa is spreading through the area. Both treatment and control group farmers reported having lower yields than in previous years and were unsure of the cause. Many noted the appearance of disease on their trees and others saw that some of their trees were dying, but most farmers could not recognize the problem as brontispa, and none knew what could be done to stop the spread of it. They clearly have not been trained in the containment of brontispa, and their trees and therefore livelihoods are at risk as a result. In the second interview, Mr. Licup said that last year brontispa control was taught during the annual training sessions and that his company had covered more land with brontispa defense training than the PCA had. He said that those farmers who reported not receiving the brontispa training must have missed the training day. It is unclear if farmers do

not attend the extension meetings, or if the meetings are not actually held, but either way only five of 48 farmers had received training in the past year.

9. Conclusions and Policy Recommendations

In this section, conclusions from the entire research are drawn, limitations of the study are mentioned, and recommendations to policy makers are given.

9.1 Conclusions

The aim of this research was to evaluate the impact of partnership farming on smallholder coconut growers. In order to do so, SC Global's partnership arrangement was chosen for assessment and the effects of the program on its members were measured. The integration of smallholder farmers into lucrative supply chains is crucial to development and poverty alleviation. Partnership farming could be an effective tool for pro-poor development and be mutually beneficial to large agribusinesses.

Quantitative analyses revealed the type of farmer that enters the partnership, and whether farmers benefit or suffer from the program. A probit model showed that the more farmland, land farmed with coconuts, and income sources a respondent has, the more likely they are to participate in the partnership. Propensity score matching indicated that in terms of yield, price per kilogram and copra gross margin, there is nothing to be gained from joining SC Global's partnership. This disappointing result can be attributed to the major flaws in SC Global's program, which were discovered through qualitative analyses.

The qualitative results exposed the incongruences between what SC Global claims about its partnership program and what appears to be happening in reality: the ACPs are acting as ordinary middlemen and not passing the higher prices or the annual incentives on to the farmers; and the extension service and field inspections are not as inclusive or frequent as they need to be.

The qualitative analysis also evaluated the predicted risks and benefits of partnership farming. Depending on a cash crop is perilous for smallholder farmers as they are greatly affected by slight changes in the market price. Undervaluing of copra was not an issue for the treatment group as they were all satisfied with the grading process. However, the majority of farmers do not get their copra graded, they instead settle for the lower price from selling their copra *pasa*. The benefit of better market access does not apply in this case as none of the

farmers, treatment or control, reported any difficulty with selling their copra. Similarly, the investment risks were not reduced by participation because no farmers invest in their copra. Lower operational risk due to assured prices and markets could not be assessed because the partnership does not include a formal guarantee of price. Loans in kind, such as fertilizer or pesticide, are also absent from the program, and the promise of extension service is generally not kept.

9.2 Limitations of the Research

The scope of this research was limited by temporal and financial constraints. The effects of one particular partnership arrangement on a small group of farmers in a single region of the Philippines were evaluated. In order to fairly determine if partnership farming is beneficial as an instrument of pro-poor development, different partnership programs in other regions should be evaluated. The success of partnership farming, as has been seen, is contingent upon the responsibility fulfillment of the three stakeholders, but also upon other factors like the specific nature of the partnership (what training and inputs are included), and the commodity being grown and purchased.

In a final interview, results from the household interviews were shared with Mr. Licup of SC Global. He was already familiar with most of the issues, which did not seem to concern him, and was unwilling to make any adjustments to the company's operations in order to benefit the farmers. Unless SC Global undergoes a major management change, a follow-up study with the company is not likely to yield different or interesting results.

9.3 Policy Recommendations

This paper is not intended as a negative portrayal of partnership farming, but rather an example of a specific partnership arrangement that happens to be less than satisfactory. There is much room for improvement in the case of SC Global, and what is learned from the shortcomings of this particular program can be applied to partnership farming implementation

elsewhere. Managers of partnerships, governments and developmental organizations may consider providing loans or advance payment, encouraging the creation of effective cooperatives, giving more technical training, and ensuring proper execution of partnership elements.

Because of the cost of labor, land investments and sometimes just to meet daily consumption requirements, farmers need access to loans. This can be a major factor when a farmer decides whether to join a partnership or not. Firms looking to enter into partnership farming should know this and take into consideration whether they will give loans or advance payment. Alternatively, government organizations or development groups could open more loan programs to assist partnership farmers.

The inferior position of smallholder farmers in the bargaining process is mostly due to their lack of market information. The government and development organizations would do well to sponsor the formation of cohesive, well-managed farmers' cooperatives. Challenges include dubiousness regarding the potential of cooperatives, disinterested members, amateur management, and risk aversion. If these challenges can be overcome farmers will be able to demand higher prices, end their dependence on processors, and rise out of poverty.

Providing frequent, thorough, and useful technical training should be a priority for partnership farming managers. Extension services are invaluable to smallholder farmers who can benefit greatly from simple, cost-effective innovations in farming techniques. The higher yields that result from technical training improve the livelihoods of farmers and increase the production capacity of processing firms. Intercropping should be included in extension curricula, as it not only increases production levels and biodiversity, but also provides a buffer against the risks of relying on a single cash crop. A nation as a whole also benefits from extension services and the resulting reduction in poverty, so it is in the best interest of the government to support or provide the training.

Partnership farming firms should show corporate social responsibility by internally monitoring their partnership program. A firm should put systems in place that prevent fraud and allow the partnership to function as it should, making sure that benefits reach farmers as intended. If a firm employs collection centers, as SC Global does with their ACPs, these centers

should not act as middlemen, because this defeats much of the purpose of partnership farming. One solution could be to have collection point employees hired as salaried workers, instead of having their earnings be based on how much produce they buy. This would eliminate some of the flaws in the organic supply chain: as the ACPs operate now they are capable of collecting copra from whomever they please, whether the produce is organic certified or not; there is no supervision to guarantee the organic standards. Another option to eliminate the middleman-type activities of the ACPs would be to have collection points managed by cooperatives. In a June 5, 2012, interview Simon Bakker of Kennemer Foods International said that his cocoa business deals only with cooperatives and does not buy from individual farmers. This removes much of the consolidation effort from the agribusiness and empowers the cooperatives. In order for the firm and its farmers to benefit from the absence of middlemen, the firm should have a transparent pricing scheme and collection centers should have no part in price setting.

A tertiary aim of this paper was to see if partnership farming of the coconut specifically should be encouraged. In the literature, it was implied that certain commodities do better than others in the context of partnership farming. Coconut seems to be a suitable crop for partnership farming as there are large economies of scale for processing, but none in production. Coconut processing machinery is much too expensive for smallholder farmers to afford, even if they were to buy together as a large group with each member contributing a small amount. Because coconuts must be harvested when they are mature and cannot be left on the tree until prices are favorable, and because copra is perishable and farmers lack the technology to preserve and store them until good market conditions arise, the sector is well served by partnership farming. If a firm is looking to establish a steady supply of organic coconuts in particular, partnership farming is especially suitable. The traceability of the supply chain in partnership farming is ideal for organic production. Also, coconuts have satisfactory yields under organic conditions, they grow quite well when left alone, and provide even higher yields with basic organic inputs.

Whether the cultivation of coconuts in Leyte or in the Philippines should be encouraged is unclear. The scope of this paper could not cover the effects of coconut farming on the environment, future destruction of rainforest if coconut cultivation is encouraged, the long

term effects of reliance on a cash crop on the poor, and the role of coconut farming in a nation's development model, but these are all issues to be explored by researchers, and considered by policy makers.

As seen in the literature, commodities best suited to partnership farming are those which are perishable, for which farmers lack post-harvest technology, and those for which there are large economies of scale in processing, and no economies of scale in production. Future research should explore the effectiveness of other partnership arrangements, with different commodities, to determine under which agricultural and socio-economic conditions partnership farming can succeed.

Ultimately, the success of partnership farming in its various forms is contingent upon the coordination and responsibility fulfillment of the three stakeholders: the private and public sectors, and the farmers themselves. The private sector is responsible for discovering and taking advantage of opportunities for partnership formation, and it should provide inputs and training to enable the success of participating farmers. The public sector needs to provide infrastructure to facilitate agricultural activities, and should also support extension service. The farmers themselves have the crucial responsibility of organizing themselves into powerful, well-coordinated groups that can request the services that they would like from their agribusiness partners, and demand the prices that they need.

10. References

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11. Appendix

11.1 Tables

Table A1: Average Income, Expenditure and Savings of Families by Region of the Philippines at 2009 Prices: 2006 and 2009. Source: National Statistics Office, 2011

Region	2009 (In thousand pesos)			2006 (In thousand pesos)		
	Income	Expenditure	Savings	Income	Expenditure	Savings
Philippines	206	176	31	173	147	26
National Capital Region	356	309	47	311	258	53
Cordillera Administrative Region	219	174	44	192	151	42
I - Ilocos	186	152	35	142	124	19
II - Cagayan Valley	181	141	40	143	118	25
III - Central Luzon	221	189	32	198	170	27
IVA - CALABARZON	249	213	36	210	186	23
IVB - MIMAROPA	141	121	21	109	93	16
V - Bicol	152	137	15	125	110	15
VI - Western Visayas	159	143	16	130	116	14
VII - Central Visayas	184	152	32	144	124	21
VIII - Eastern Visayas	160	128	32	126	104	22
IX - Zamboanga Peninsula	144	116	28	125	99	27
X - Northern Mindanao	165	139	26	142	117	25
XI - Davao	166	142	24	135	115	19
XII - SOCCSKSARGEN	154	132	22	114	96	18
XIII - Caraga	149	125	23	118	100	18
Autonomous Region in Muslim Mindanao	113	98	15	89	75	14

Note: Details may not add up to totals due to rounding.

Table A2: GINI Coefficient by Region of the Philippines: 2006 and 2009. Source: National Statistics Office, 2011

Region	2009	2006
Philippines	0.4484	0.4580
National Capital Region	0.3953	0.3988
Cordillera Administrative Region	0.4212	0.4418
I - Ilocos	0.4086	0.3953
II - Cagayan Valley	0.4425	0.4216
III - Central Luzon	0.3727	0.3994
IVA - CALABARZON	0.4063	0.4082
IVB - MIMAROPA	0.4004	0.4106
V - Bicol	0.4164	0.4428
VI - Western Visayas	0.4197	0.4326
VII - Central Visayas	0.4601	0.4639
VIII - Eastern Visayas	0.4841	0.4828
IX - Zamboanga Peninsula	0.4738	0.5054
X - Northern Mindanao	0.4737	0.4806
XI - Davao	0.4275	0.4225
XII - SOCCSKSARGEN	0.4425	0.4006
XIII - Caraga	0.4595	0.4452
Autonomous Region in Muslim Mindanao	0.2948	0.3113

Table A3: Functional Literacy Rate of Population 10 to 64 Years of Age, by Sex, by Region of the Philippines: 2003. Source: National Statistics Office, 2003.

Region	Functional Literacy Rate		
	Both Sexes	Male	Female
	(in percent)		
Philippines	84.1	81.9	86.3
National Capital Region	94.6	94.0	95.2
Cordillera Administrative Region	85.4	83.9	87.0
I - Ilocos	88.6	88.1	89.2
II - Cagayan Valley	84.4	82.9	86.1
III - Central Luzon	86.9	86.5	87.4
IVA - Calabarzon	90.4	88.8	92.0
IVB - Mimaropa	82.3	80.2	84.4
V - Bicol	80.1	76.6	83.8
VI - Western Visayas	81.5	77.7	85.2
VII - Central Visayas	81.7	79.8	83.6
VIII - Eastern Visayas	76.7	71.7	82.1
IX - Zamboanga Peninsula	74.8	69.8	79.8
X - Northern Mindanao	83.7	80.5	86.9
XI - Davao	77.8	73.7	82.2
XII - Soccsksargen	77.1	74.5	79.7
XIII - Caraga	81.0	77.3	84.6
Autonomous Region of Muslim Mindanao	62.9	63.6	62.1

Table A4: Population and Growth Rates by Province and City of Region VIII: 1995-2007. Source: National Statistics Office, 2011.

Province/City	Total Population			Annual Population Growth Rate	
	September 1, 1995	May 1, 2000	August 1, 2007	1995-2000	2000-2007
Philippines	**68,616,536**	**76,504,008**	**88,574,614**	**2.36**	**2.04**
Region VIII	**3,366,917**	**3,610,355**	**3,912,936**	**1.51**	**1.12**
Provinces					
Leyte	1,511,251	1,592,336	1,722,036	1.13	1.09
Biliran	132,209	140,274	150,031	1.28	0.93
Southern Leyte	317,565	360,160	390,847	2.73	1.13
Samar	589,373	641,124	695,149	1.82	1.12
Eastern Samar	362,234	375,822	405,114	0.79	1.04
Northern Samar	454,195	500,639	549,759	2.11	1.30
Cities					
Tacloban City	167,310	178,803	217,199	1.43	2.72
Ormoc City	144,003	154,297	177,524	1.49	1.95
Baybay City	86,179	95,630	102,526	2.25	0.96
Maasin City	63,746	71,163	79,737	2.39	1.58
Calbayog City	129,216	147,187	163,657	2.83	1.47
Catbalogan City	76,324	84,180	92,454	2.12	1.30
Borongan City	48,638	55,141	59,354	2.72	1.02

Note: Provincial figures include cities.

Table A5: Poverty Incidence and Magnitude of Poor Population of Region VIII by Basic Sector: 2003, 2006, and 2009. Source: National Statistics Office, 2011.

Basic Sector	Poverty Incidence %			Magnitude of Poor			Increase/Decrease			
	2003	2006	2009	2003	2006	2009	Poverty Incidence		Magnitude of Poor	
							(2003-2006)	(2006-2009)	(2003-2006)	(2006-2009)
Women	36.7	37.8	39.6	671,065	741,273	808,543	1.1	1.8	70,207	67,270
Youth	28.8	30.0	37.1	255,918	299,736	398,645	1.2	7.1	43,819	98,908
Children	46.7	49.0	50.8	865,288	904,144	943,877	2.3	1.7	38,856	39,734
Senior Citizens	20.3	24.3	22.5	59,842	92,819	95,174	4.0	(1.9)	32,978	2,355
Urban Poor	24.7	20.5	28.7	202,839	180,284	268,471	(4.3)	8.2	(22,555)	88,187
Migrant and Formal Sector Workers	27.3	26.2	31.9	144,068	152,831	204,444	(1.0)	5.6	8,762	51,613
Farmers	37.3	42.1	46.7	115,059	139,185	116,966	4.8	4.6	24,126	(22,219)
Fishermen	29.0	40.2	45.7	26,864	29,785	31,954	11.2	5.5	2,921	2,169
Self-employed and Unpaid Family Workers	33.3	34.6	38.2	333,260	293,932	316,767	1.3	3.6	(39,329)	22,836

Notes: 1. Poverty incidence is the proportion of poor population to total population.
2. ( ) negative value

Table A6: Distribution of Respondents by Barangay

	Number of Respondents	
Barangay	Control/Non-Partnership	Treatment/Partnership
Gabas	15	3
Patag	18	6
Guadalupe	1	0
Marcos	1	0
San Augustin	3	12
Bunga	2	20
Maybog	0	2
Caridad	12	5

Table A7: Logistic model showing household characteristic variables as predictors of participation

Logistic regression — Number of obs = 100
LR chi2 (11) = 36.29
Prob > chi2 = 0.0003
Log likelihood = -51.091 — Pseudo R2 = 0.2621

Participation in partnership	Coefficient	Standard Error	z	P>|z|
Dummy for gender	-0.758	0.560	-1.35	0.176
Age	0.481	0.028	1.72	0.086
Education level (years)	0.146	0.096	1.53	0.125
Household size	0.294	0.166	1.77	0.077
Dependency ratio	-0.414	0.242	-1.71	0.087
Total hectares farmed	0.242	0.125	1.93	0.053
Share of farm land with productive coconuts	5.036	1.356	3.71	0.000
Years of experience farming coconuts	-0.026	0.017	-1.38	0.168
Dummy for receiving remittances	-0.530	0.655	-0.81	0.418
Number of income sources	0.628	0.311	2.02	0.043
Distance to the SC Global facility (km)	-0.074	0.130	-0.57	0.570
Dummy for membership in an organization	0.038	0.553	0.07	0.945
Constant	-9.737	2.781	-3.50	0.000

11.2 Figures

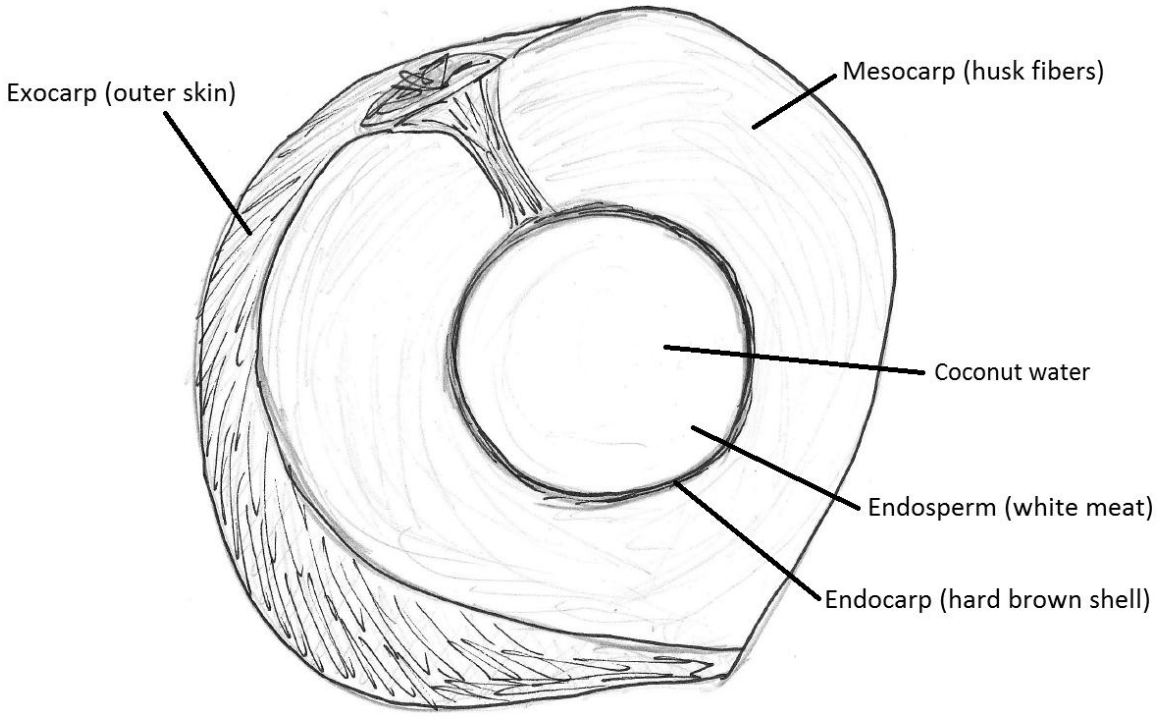


Figure A1: Diagram of a coconut. Source: Own drawing

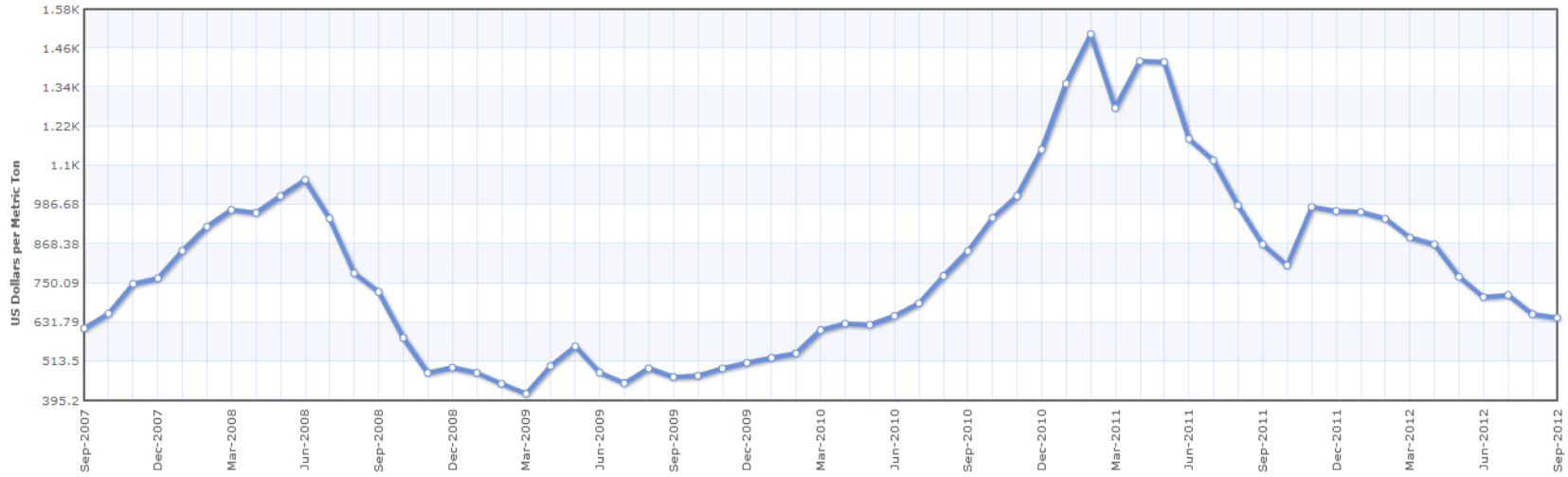


Figure A2: Monthly Copra Price: US Dollars per Metric Ton, September 2007-September 2012, bulk, c.i.f. N.W. Europe. Source: World Bank, 2012, on www.indexmundi.com/commodities/?commodity=copra&months=60

11.3 Philippine Coconut Authority Interview Notes

On May 28, 2012, a meeting was held with Joel Pilapil, the Assistant Regional Manager of the Philippine Coconut Authority in Region VIII, in Palo. The topics of PPPs and the brontispa pest were discussed.

Mr. Pilapil said that he has been pleased with the results of past PPPs with GIZ, and is interested in developing more, especially those dealing with coconut seedlings. In 2010, GIZ contributed funds to a PPP with the PCA and the Leyte Coconut Farmers' Federation. The PCA's role is to provide planting material to the Federation's nursery, which then grows the seedlings and distributes them to farmers. Mr. Pilapil reports that this PPP is going well.

According to Mr. Pilapil, when brontispa first arrived from other Asian countries the threat to the Philippines' coconuts was overestimated and overhyped because there was no immediate pest control available. The PCA began distributing parasitoids three years ago, and now has a parasitoid laboratory in each province. Mr. Pilapil also said that native ecological predators already exist, that it is just a matter of them "developing a taste for the brontispa". Although it was mentioned that the research respondents seem to be struggling with brontispa infestations, Mr. Pilapil said he does not think that it is that big of a problem, and that the infestation is contained.

11.4 PPP with GIZ, AFFIRE and SC Global

GIZ in the Philippines is looking to improve the effectiveness of cooperatives and better integrate them into the supply chain structure (GIZ, 2010). One way GIZ is accomplishing this is by supporting PPPs that encourage or require the participation of cooperatives. Such collaborations are one way that the public sector can encourage partnership farming. Recently a PPP was formed with SC Global and the local coconut farmers' federation AFFIRE (Agribusiness Federation of Financial Intermediaries for Rural Empowerment). The nature of the GIZ PPP and the background of AFFIRE were learned about during a March 16, 2012, visit to the AFFIRE coconut processing plant in Matalom, Leyte.

AFFIRE's mandate is "to conduct researches and new projects or business ventures that will serve as showcases or models to the member-cooperatives and groups, and that will help in advancing the growth and development of the local economy and the welfare of the community [in the local area]" (Villamor, 2012a). One of the ways this goal has been accomplished is through the PPP promotion of organic farming and white copra processing on Leyte. SC Global and AFFIRE approached GIZ with the idea, signed a memorandum of agreement and a consultancy contract, constructed and installed the processing plants, and launched the white copra project in July of 2009.

The PPP aimed to identify potential Community-Based Forest Management (CBFM) farmer groups and coconut farmers in the area and encourage them to supply coconuts to the AFFIRE white copra processing facility in Matalom, via AFFIRE's cooperatives, which serve as intermediaries. A business plan for the processing plant was created, and basic savings and credit schemes were established for the CBFM farmers. The processing plant was built, and the necessary equipment purchased; audits were performed and the plant was certified as organic by Ecocert. Farmers, field inspectors, POs, and coop members were trained and certified in both organic farming and good agricultural practices. As part of the organic farming scheme, intercropping with bananas and papaya was introduced and the supply chain was monitored regularly.

Among AFFIRE's coconut products are: coco peat, dried coconut fiber, carbonized rice hull, coconets for erosion control, and white copra. Their white copra is the exact same thing as desiccated coconut, but it cannot be marketed as such because it lacks the food grade label. Desiccated coconut is used in food processing and therefore must be food grade; AFFIRE's production facility has not been deemed food safe. AFFIRE is in the process of deciding whether making the upgrades to its facility in order to be able to make food grade desiccated coconut would be worth the investment. The production area would need to have metal grates on the floors for drainage, a better ventilation system, insect screens on the windows, and tiles on all surfaces; the managers are not yet sure if the opening in the desiccated coconut market would be large enough to justify these costly improvements.

SC Global's role in the PPP was to provide some financial backing, be AFFIRE's connection to the organic certification via Ecocert, and purchase coconuts and bananas from participating farmers for SC Global's copra and banana chip production. Bananas and coconuts work well together in organic intercropping systems, and SC Global's partnership farmers are advised to adapt the technique, but farmers in the research area seldom do. Mr. Licup in a May

24, 2012, interview stated the local farmers refuse to grow bananas between their coconuts because of “cultural issues”, and when pressed on the topic Mr. Licup said it was because they are “lazy”. Alternatively, it could be that the farmers lack the inputs and technical knowledge to adapt the technique and are too poor to take that large of an investment risk. In either case, SC Global could not meet its banana supply needs in Baybay so it was forced to source its bananas further south, from the Matalom farmers.

As part of the PPP, GIZ donated a coconut husker, peeling knives, a baling press for coir, two white copra drying ovens, and a solar dryer. The solar dryer is about a quarter hectare of pavement with one make-shift basketball hoop in front of the production facility where the coir can be dried in the sun, and after work hours the laborers and their children play basketball on it.

In 2011 the PPP faded out of existence, and while it had great potential and was created by some very motivated and well-meaning individuals, it cannot be counted as a success. The first concern is why a brand new production facility was built without meeting food grade standards. The current price of desiccated coconut is 120PhP/kg, while white copra only sells for 68PhP/kg. Had the production facility been built to standards in the first place AFFIRE would not be faced with the difficult decision of whether upgrading is worthwhile or not. Secondly, in the process of trying to involve five pre-identified cooperatives in a lucrative new supply chain, the nature of capitalism and the free market were overlooked. The AFFIRE production facility in Matalom is surrounded by hundreds of hectares of coconut lands, but because of the PPP agreement AFFIRE was required to source its coconuts from cooperatives that are many kilometers away. The immense transport and transaction costs coupled with the fact that the five cooperatives were unable to meet AFFIRE’s daily coconut supply minimum drove AFFIRE to source its coconuts from neighboring coconut farmers who are not members of cooperatives and whose compliance with organic standards is undocumented and questionable.

11.5 Control Group Questionnaire (for non-partnership farmers)

M.Sc. Research: An Economic Analysis of Partnership Farming in the Visayas

Household Questionnaire – Leyte 2012

This research is to study the effects of partnership farming on coconut growers and is conducted on behalf of GIZ and the University of Hohenheim, Germany. Your participation and cooperation in answering these questions is very much appreciated and purely voluntary. Your responses will remain confidential and will be pooled together with those of numerous other households for analysis.

The interview will take 35-50 minutes of your time. Brief follow-up interviews may be needed.

I. Questionnaire Identification

1. Date of interview: ____/____/2012 *(day/month/year)*
2. Barangay name:_____
3. Location in barangay:_____
4. Interviewer's name: _____
5. Interviewer's signature: _____

II. Respondent Identification

1. Respondent's name: _____
2. Gender: _____
3. Marital status: _____
4. Number of household members: _____
5. Household (HH) identification number: _____

Partnership Farmer or **Non-Partnership Farmer**

(circle one)

III. Partnership Participation

1. Do you currently grow coconuts?

   _____Yes _____No

2. Do you sell your coconuts?

   _____Yes _____No

3. Do you currently sell coconuts to SC Global?

   _____Yes _____No

4. To whom do you sell your coconuts?

5. What percentage of the coconuts that you grow is for:
   a) Household consumption? _____%
   b) Sale? _____%

IV. Household Characteristics

1. What is the age of your HH head? _____years
2. What is the gender of your HH head? _____Male _____Female
3. What level of education does your HH head have? *Code 1: Education* _____
4. How many hectares of land do you farm on? _____ha
5. Of those hectares, how many do you:

   Own_____ha Lease_____ha

   Have legal usage rights to_____ha Have no legal usage rights to_____ha
6. Please check which apply:

   _____Titled land _____Declaration CBFM
7. How many years of experience does your HH have growing coconuts? _____years
8. How many members of your HH contribute to your HH's income? _____people
9. Please list your HH's main sources of income (including coconut growing, and remittances if applicable) in order of importance:

1	
2	
3	
4	
5	
6	
7	

10. Do you have any experience with SC Global?

_____Yes _____No

11. If yes, please describe:

12. How far away is the nearest collection point? _____km _____minutes walking
13. How far away is the nearest processing center? _____km _____minutes walking
14. Is anyone in your HH a member of any of the following?

Organization	No	Yes
a. People's Organization		
b. Farmer's Organization		
c. Cooperative		
d. Trader's Organization		
e. Credit Group		
f. Women's Group		
Other:		

V. Coconut production

1. How many hectares do you grow coconuts on? _____ha
2. How many coconut plants do you have per hectare?

Plot 1:_____ Plot 2:_____ Plot 3:_____ Plot 4:_____ Plot 5:_____

3. How many coconut plants do you have of the following types/age groups:

Tall Palms (C. nucifera typica)

Young, not yet flowering (≈0-8 yrs old)	Productive, prime fruit bearing (≈9-65 yrs old)	Old, nearly senescent (≈66-75 yrs old)

Dwarf Palms (C. nucifera nana)

Young, not yet flowering (≈0-3 yrs old)	Productive, prime fruit bearing (≈4-35 yrs old)	Old, nearly senescent (≈36-45 yrs old)

4. About how many pieces did your average productive plant yield in the past year? _____pieces
5. How many pieces did you grow in the past year? _____pieces
6. About how many pieces are needed to make 1kg of copra? _____pieces
7. How many kilograms of copra did you sell in the past year? _____kg

VI. Copra Price

1. What was the average price per kilogram that you received for your copra in the past year? _____Php/kg

2. Please indicate the extent to which quality affects the price you receive for your coconuts:

0 1 2 3 4 5 6 7 8 9 10

Quality is not important — Quality is very important

3. Do you experience volatile coconut prices? Please indicate the degree of price fluctuation that you experience:

0 1 2 3 4 5 6 7 8 9 10

Very steady — Moderate — Very volatile

4. Are you paid for your coconuts upon delivery or do you have to wait for payment?

_____Paid on delivery _____Must wait

5. If you must wait, how many days after delivery do you usually receive payment? _____days
6. If you must wait, how does this affect your household operations? Please explain:

VII. Production Costs

1. For your coconut production, how much of the following did you use and what did it cost for each use?
   Materials:

Inputs	
Fertilizer	
Kind of Fertilizer	
Quantity Used	
Price, Php per unit	
Pesticides	
Kind of Pesticides(Herbicide, Fungicide)	
Quantity Used	
Price, Php per unit	
Other Input	
Kind of Input	
Quantity Used	
Price, Php per unit	

HH Labor:

Labor, in work days, per year	**What is the local labor rate per work day? _____Php/day**	
	HH/Exch	**Hired**
Maintenance and Protection		
Weeding		
Fertilizer Application		
Spraying		
Harvesting		
Processing		
Marketing		

VIII. Partnership Alternatives

1. What other options do you have for selling your copra? (Who else can you sell it to?) And why don't you choose these options? Please explain:

IX. Risks

1. When you deliver your copra how is its quality graded? Please explain how it works and who is involved:

2. In the past year have your goods been undervalued (graded at a lower level than they should have been) upon delivery?

_____Yes _____No

3. If yes, please explain:

4. Does the market price fluctuation of coconuts affect your HH's income?

0 1 2 3 4 5 6 7 8 9 10

Price has little effect Price has a large effect

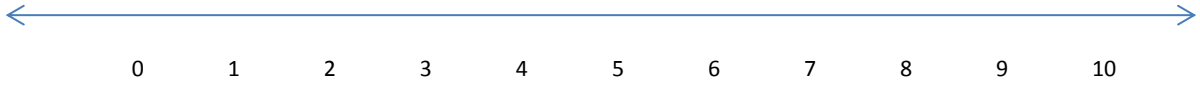
X. Benefits

1. How easy or difficult is it to sell your copra? Please indicate:

0 1 2 3 4 5 6 7 8 9 10

Very hard to sell Very easy to sell

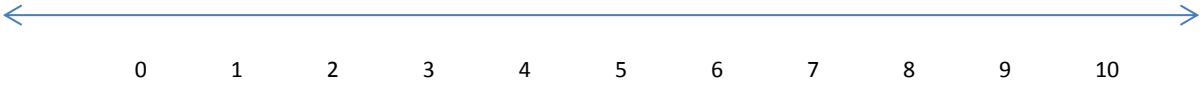
2. If it were easier to sell your copra would you increase your coconut production significantly? Please indicate on the line:



I would not increase production I would increase production significantly

3. Please explain:

4. When you invest money into developing your farm, how important are investments in your copra production? Please indicate on the line:



I rarely invest in my coconuts All investments go to coconut production

5. Please explain:

6. How do you usually bring your copra to where you sell it and how much does one journey cost?

_____Habal-habal:_____Php _____Jeepney :_____Php

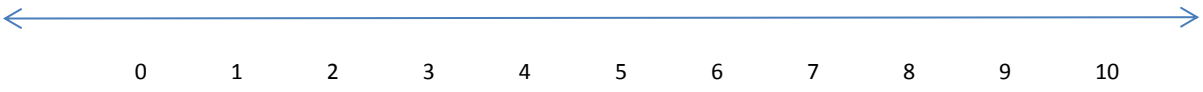
_____Carabao:_____Php _____Walking:_____Php

_____Other:_____:_____Php

7. How many hours are used up every time you bring your copra to be sold? Include transport time, quality grading, negotiations and all activity necessary to sell copra. _____hours

8. Each time you bring your copra to be sold, how many kilograms do you transport? _____kg

9. Does the cost of bringing your copra to your usual buyer have an effect on how much copra you produce? (Would you grow more coconuts if the transport costs were lower?) Please indicate on the line:



10. Have you received extension (training in coconut cultivation or other farming techniques) within the past year?

_____Yes _____No

11. How do you pay for the extension that you receive?

_____I don't, it is free

_____The cost is deducted from my payment upon delivery of the coconuts

_____I pay directly

_____Other: _____

12. Who provides this extension service?

13. Please fill in the table:

Extension regarding:	No	Yes	Times per year and which months
Soil fertility			
Pest control			
Weed control			
Intercropping			
Erosion control			
Water management			
Agroforestry			
Livestock			
Marketing			
Business			
Other:			

14. Are you currently organic certified?

_____Yes _____No

15. If yes, which organic certificate do you have?

16. How much did the certification cost? (just the certification, not the investments in converting)

_____Php

11.6 Treatment Group Questionnaire (for partnership farmers)

M.Sc. Research: An Economic Analysis of Partnership Farming in the Visayas

Household Questionnaire – Leyte 2012

This research is to study the effects of partnership farming on coconut growers and is conducted on behalf of GIZ and the University of Hohenheim, Germany. Your participation and cooperation in answering these questions is very much appreciated and purely voluntary. Your responses will remain confidential and will be pooled together with those of numerous other households for analysis.

The interview will take 35-50 minutes of your time. Brief follow-up interviews may be needed.

XI. Questionnaire Identification

6. Date of interview: ____/____/2012 *(day/month/year)*
7. Barangay name:_____
8. Location in barangay:_____
9. Interviewer's Name: _____
10. Interviewer's Signature: _____

XII. Respondent Identification

6. Respondent's Name: _____
7. Gender: _____
8. Marital Status: _____
9. Number of household members: _____
10. Household (HH) Identification Number: _____

Partnership Farmer or **Non-Partnership Farmer**

(circle one)

XIII. Partnership Participation

6. Do you currently grow coconuts?

   _____Yes _____No

7. Do you currently sell coconuts to SC Global?

   _____Yes _____No

8. How many months have you been selling coconuts to SC Global (more or less consistently)?

   _____months

9. What percentage of the coconuts that you grow is for:
   c) Household consumption? _____%
   d) Sale to SC Global? _____%
   e) Sale to other buyers? _____%

XIV. Household Characteristics

15. What is the age of your HH head? _____years
16. What is the gender of your HH head? _____Male _____Female
17. What level of education does your HH head have? *Code 1: Education* _____
18. How many hectares of land do you farm on? _____ha
19. Of those hectares, how many do you:

    Own_____ha Lease_____ha

    Have legal usage rights to_____ha Have no legal usage rights to_____ha

20. Please check which apply:

    _____Titled land _____Declaration

21. How many years of experience does your HH have growing coconuts? _____years
22. How many members of your HH contribute to your HH's income? _____people
23. Please list your HH's main sources of income (including coconut growing, and remittances if applicable) in order of importance:

1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	

24. Before entering this program, did you have any experience with SC Global?

_____Yes _____No

25. If yes, please describe:

26. How far away is the nearest Accredited Collection Point (ACP)?

_____km _____minutes walking

27. How many kilometers away is the SC Global processing plant?

_____km _____minutes walking

28. Is anyone in your HH a member of any of the following?

Organization	No	Yes
g. People's Organization		
h. Farmer's Organization		
i. Cooperative		
j. Trader's Organization		
k. Credit Group		
l. Women's Group		
Other:		

XV. Coconut production

8. How many hectares do you grow coconuts on? _____ha
9. How many coconut plants do you have per hectare?

Plot 1:_____ Plot 2:_____ Plot 3:_____ Plot 4:_____ Plot 5:_____

10. How many coconut plants do you have of the following types/age groups:

Tall Palms (C. nucifera typica)

Young, not yet flowering (≈0-8 yrs old)	Productive, prime fruit bearing (≈9-65 yrs old)	Old, nearly senescent (≈66-75 yrs old)

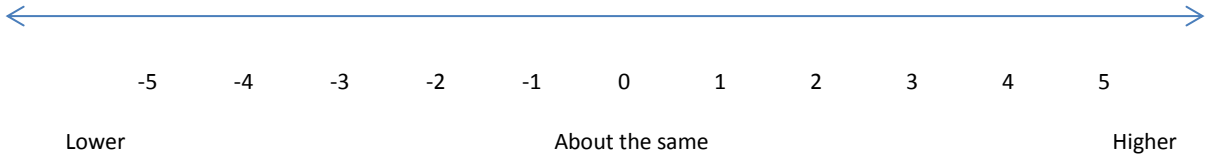
Dwarf Palms (C. nucifera nana)

Young, not yet flowering (≈0-3 yrs old)	Productive, prime fruit bearing (≈4-35 yrs old)	Old, nearly senescent (≈36-45 yrs old)

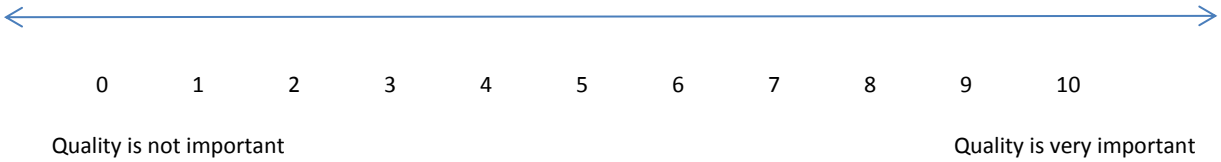
11. About how many pieces did your average productive plant yield in the past year? _____pieces
12. How many pieces did you sell in the past year? _____pieces
13. About how many pieces are needed to make 1kg of copra? _____pieces
14. How many kilograms of copra did you sell in the past year? _____kg

XVI. Coconut Price

7. What was the average price per kilogram that you received for your coconuts in the past year? _____Php/kg
8. Please indicate how the price you receive per coconut has changed since entering the program:



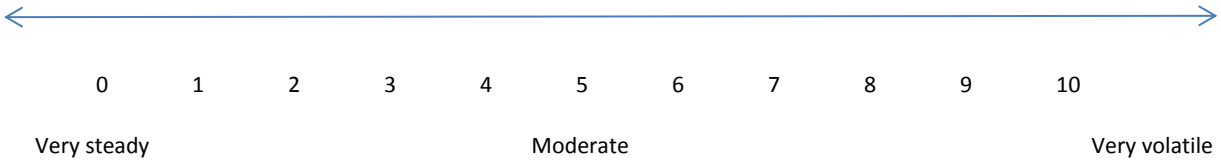
9. Please indicate the extent to which quality affects the price you receive for your coconuts:



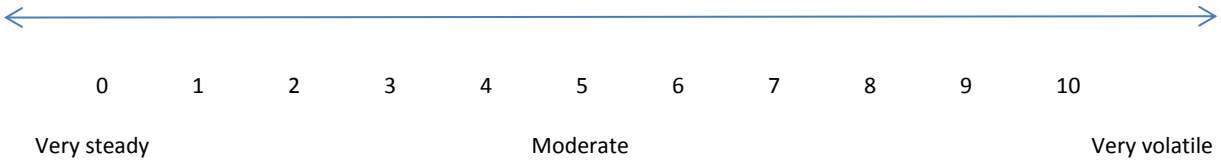
10. Since entering into the program do you experience more or less volatile coconut prices?

_____Less volatile _____About the same _____More volatile

11. Please rank the degree of price fluctuation that you experienced before entering the program:



12. Please rank the degree of price fluctuation that you experience now that you're in the program:



13. Are you paid for your coconuts upon delivery or do you have to wait for payment?

_____Paid on delivery _____Must wait

14. If you must wait, how many days after delivery do you usually receive payment? _____days
15. If you must wait, how does this affect your household operations? Please explain:

XVII. Production Costs

1. For your coconut production, how much of the following did you use and what did it cost for each use?

Inputs	
Fertilizer	
Kind of Fertilizer	
Quantity Used	
Price, Php per unit	
Pesticides	
Kind of Pesticides(Herbicide, Fungicide)	
Quantity Used	
Price, Php per unit	
Other Input	
Kind of Input	
Quantity Used	
Price, Php per unit	

Labor, in work days, per	**What is the local labor rate per work day? _____Php/day**

year		
	HH/Exch	Hired
Maintenance and Protection		
Weeding		
Fertilizer Application		
Spraying		
Harvesting		
Processing		
Marketing		

2. Since entering into the program has your HH adjusted its work activities? (family members doing different activities, focusing more/less on coconuts, having more free time etc.) Please explain:

XVIII. Partnership Alternatives

2. If you did not usually sell to SC Global, how would you sell your coconuts? *Mark those that apply.*

_____To a different processing plant

_____To a middleman

_____Directly at market

_____Other_____

3. If you did not usually sell to SC Global, how would that affect your farming activities? *Mark those that apply.*

_____Grow fewer coconuts

_____Grow about the same number of coconuts

_____Grow more coconuts

_____Focus on other activities like:

_____

_____

_____

XIX. Risks

5. When you deliver your copra how is their quality graded? Please explain how it works and who is involved:

6. In the past year have your goods been undervalued (graded at a lower level than they should have been) upon delivery?

_____Yes _____No

7. If yes, please explain:

8. Does the market price fluctuation of coconuts affect your HH's income?

0 1 2 3 4 5 6 7 8 9 10

Price does not affect our HH income — Price strongly affects our HH income

XX. Benefits

1. How easy or difficult is it to sell your copra? Please indicate:

0 1 2 3 4 5 6 7 8 9 10

Very hard to sell — Very easy to sell

2. Since entering the program, regarding prices and marketing do you feel it's more or less risky to grow coconuts for sale? Please indicate on the line:

-5 -4 -3 -2 -1 0 1 2 3 4 5

Less risky — About the same — More risky

3. Please explain:

4. When you invest money into developing your farm, how important are investments in your copra production? Please indicate on the line:

0 1 2 3 4 5 6 7 8 9 10

I rarely invest in my coconuts — All investments go to coconut production

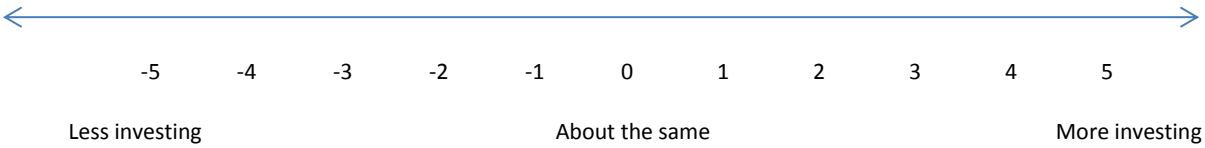
5. Since entering the program do you feel more or less confident investing in your coconut cultivation? Please indicate on the line:

-5 -4 -3 -2 -1 0 1 2 3 4 5

Less confident — About the same — More confident

6. Please explain:

7. How has taking part in the program affected what amount of money you invest in your coconut cultivation? Please indicate on the line:

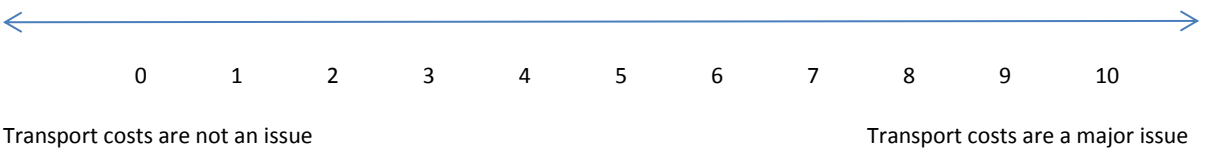


8. Please explain:

9. How do you usually bring your copra to where you sell it and how much does one journey cost?
   _____Habal-habal:_____Php _____Jeepney :_____Php
   _____Carabao:_____Php _____Walking:_____Php
   _____Other:_____:_____Php
10. How many hours are used up every time you bring your copra to be sold? Include transport time, quality grading, negotiations and all activity necessary to sell copra. _____hours

11. Each time you bring your copra to be sold, how many kilograms do you transport? _____kg

12. Does the cost of bringing your copra to your usual buyer have an effect on how much copra you produce? (Would you grow more coconuts if the transport costs were lower?) Please indicate on the line:



13. Compared with how much it cost to bring your coconuts to a buyer before you entered the program, does it cost more, less, or about the same to transport your coconuts to the nearest Accredited Collection Point? Please indicate on the line:

-5 -4 -3 -2 -1 0 1 2 3 4 5

Costs less now About the same Costs more now

14. What inputs do you receive as part of the program? Please list:

15. Do you receive extension (training in coconut cultivation or other farming techniques) as part of the program? Please use the table:

Extension regarding:	No	Yes	Times per year and which months
Soil fertility			
Pest control			
Weed control			
Intercropping			
Erosion control			
Water management			
Agroforestry			
Livestock			
Marketing			
Business			
Other:			

16. How do you pay for the inputs and/or extension that you receive?

_____I don't, it is free

_____The cost is deducted from my payment upon delivery of the coconuts

_____I pay directly

_____Other: _____

17. Are you currently organic certified?

_____Yes _____No

18. How much did the certification cost? (just the certification, not the investments in converting)

_____Php

XXI. Standard of Living

1. Since entering the program has your HH income increased, decreased or stayed about the same? Please indicate on the line:

-5 -4 -3 -2 -1 0 1 2 3 4 5

Income decreased About the same Income increased

2. Please indicate in what way your standard of living has changed since entering the program regarding the following: *Mark those that apply.*

	Increased	About the same	Decreased
The amount of food our HH eats each day			
The quality of food that we eat			
The variety of food that we eat			
The number of improvements we make to our home each month (painting, roofing, general repairs, etc.)			
How much time we devote to other tasks			
How much time our kids have to study			
How much time we have to socialize			

XXII. Entering and Maintaining the Partnership

1. Why did you decide to join the program? Please explain:

2. For the program you had to become organic certified, what changes did you have to make on your farm? Please list:

3. Were the changes difficult to make? Please indicate on the line:

0 1 2 3 4 5 6 7 8 9 10

Not difficult at all Very difficult

4. Please explain:

5. Would you say that the investments you made in converting to organic were worthwhile, or not?

_____Yes _____No _____Not sure

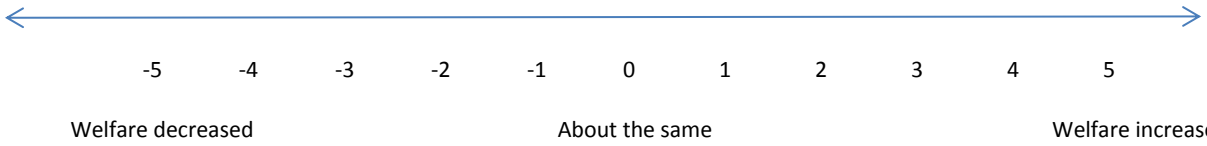
6. Please explain:

7. How long did it take to recover the costs you incurred converting to organic?

_____months _____not yet recovered

XXIII. Perceptions About Partnership Farming

1. Taking into account everything we've talked about today please indicate on the line where your general welfare is relevant to where it was before you entered the program:



2. Do you think partnership farming is a useful way to raise incomes for local farmers?

_____Yes _____No

3. Would you recommend partnership farming to another farmer?

_____Yes _____No

4. Please explain:

5. Is there anything else you would like to add regarding the program and its overall impact?

6. Do you have any recommendations for how to improve the program?

11.7 Declaration

I, Emily McNulty, born on July 10, 1987, in Zweibrücken, Germany, hereby declare on my honor that this Master Thesis has been independently prepared, solely with the support of the listed literature references, and that no information has been presented that has not been officially acknowledged.

Supervisor: Prof. M. Zeller

Thesis Topic: An Economic Analysis of Partnership Farming in the Visayas, Philippines

Semester: V

Matriculation Number: 513047

I declare, here within, that I have transferred the final digital text document (in the format .pdf) to my mentoring supervisor, and that the content and wording is entirely my own work. I am aware that the digital version of my document can and/or will be checked for plagiarism with the help of an analyses software program.

City, Date, Signature