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COMMITTEE ON COMMODITY PROBLEMS

INTERGOVERNMENTAL GROUP ON BANANAS AND TROPICAL FRUITS

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INSTITUTIONAL ARRANGEMENTS AND STRUCTURE OF THE BANANA AND TROPICAL FRUIT MARKETS IN PRODUCING COUNTRIES AND THEIR IMPACT ON INCOME LEVELS OF SMALLHOLDERS

I. INTRODUCTION

1. At its last session, the IGG on Bananas and Tropical Fruits, in recognizing the importance of institutional set-up on the economic welfare of smallholders in developing countries, recommended that additional studies be carried out focussing specifically on the institutional set-up and market structure for bananas and tropical fruits in major producing countries and their impact on smallholders' incomes. The Group stressed that empowering smallholders by organizing them into legal entities, providing technical assistance in production and facilitating access to credit, would enhance their ability to add value through participation in the supply chain. It recommended that more studies be carried out examining ways to enhance smallholders' contribution to value-addition along the supply chain through better organization, quality improvement and credit availability.

2. Most agricultural commodities have to pass through a sequential process from the farm gate to consumers. This process includes raw material production, various types of transformation through intermediate manufacturing stages, and the delivery of a finished product to the marketplace. Such a process does not only result in changes to the physical and value characteristics but also to the ownership of the commodity as it is passed on. The entire sequential process is termed a "supply chain" – a functionally integrated process of production, marketing, service and delivery.

3. While considerable attention has been given to supply chain management as an approach for improving marketing efficiency primarily from the perspective of retailers, wholesalers, or food manufacturers and their suppliers, little effort has been devoted to explore measures to

ensure that farmers' gain from value addition along the supply chain. In a perfectly competitive environment, market agents are remunerated for their economic activity including risk, and changes in cost and price will be fully transmitted through the chain. Unfortunately, there are few competitive markets in the real world. Many factors such as imperfect market structure and asymmetry of information often cause market failure. When markets fail in such instances, agents over the chain can gain from value addition, enabling them to suppress other mutually beneficial gains from exchange.

4. With emerging developments associated with globalization and industry supply management, supermarket chains and multinational marketing firms have considerably enhanced their market power over global food systems. While these developments may contribute to a significant improvement in supply efficiency, they nevertheless pose challenges to policy-makers; none more so than in ensuring that the millions of smallholders who make up production of a commodity will stand to benefit from these new trends. Indeed, it is often claimed that smallholders who lie at the bottom of the chain are exposed to the risk of potentially unfair and anti-competitive treatment by multinational marketing firms and food processors involved in the next stage of the value chain.

5. In seeking to understand the implications of rapidly evolving supply chains for smallholder producers, it is important to recognize that they are a very heterogeneous group, differing both in their ability to access higher value markets, which often imply meeting higher and more consistent quality standards and having the skills to negotiate favorable contractual arrangements, and in their access to appropriate levels of inputs, technology and knowledge. While improvements to institutional arrangements and structures, such as strengthening producer organizations, may benefit some categories of smallholders, for others, public sector intervention to address the market failures that are constraining their access to input and output markets will be required.

6. In formulating policy interventions in support of smallholder participation in value chain development, it is important to be cognizant of the fact that not all smallholder producers will seek to add value through intensifying their existing production. Some categories will benefit from diversification into other products, some will reduce their labour allocation to their own farm production as rural labour markets develop, and others still will leave the agriculture sector. Policy interventions will influence the choices available to smallholders and will therefore need to be well targeted and time bound to facilitate sectoral transformation that is to the benefit of different categories of smallholder producers.

7. This document provides case studies reviewing the institutional arrangements and practices characterizing supply chains for bananas in Colombia and smallholder tropical fruits producers in China. A case study on the institutional arrangements in Cameroon will be presented at the session. Delegates are requested to share their experiences and provide guidance on the future direction of work in this area.

II. INSTITUTIONAL ARRANGEMENTS IN THE BANANA SUPPLY CHAIN IN COLOMBIA INVOLVING SMALLHOLDERS¹

8. The banana sub-sector in Colombia redefined its priorities recently, focusing on exchange rates and pressure of international prices, rather than on the turmoils in banana producing regions. Smallholders need support to improve organizational processes, product quality and credit availability, among other things, in order to adjust to conditions in the market and institutional arrangements along the supply chain. This case study reviews the market and institutional

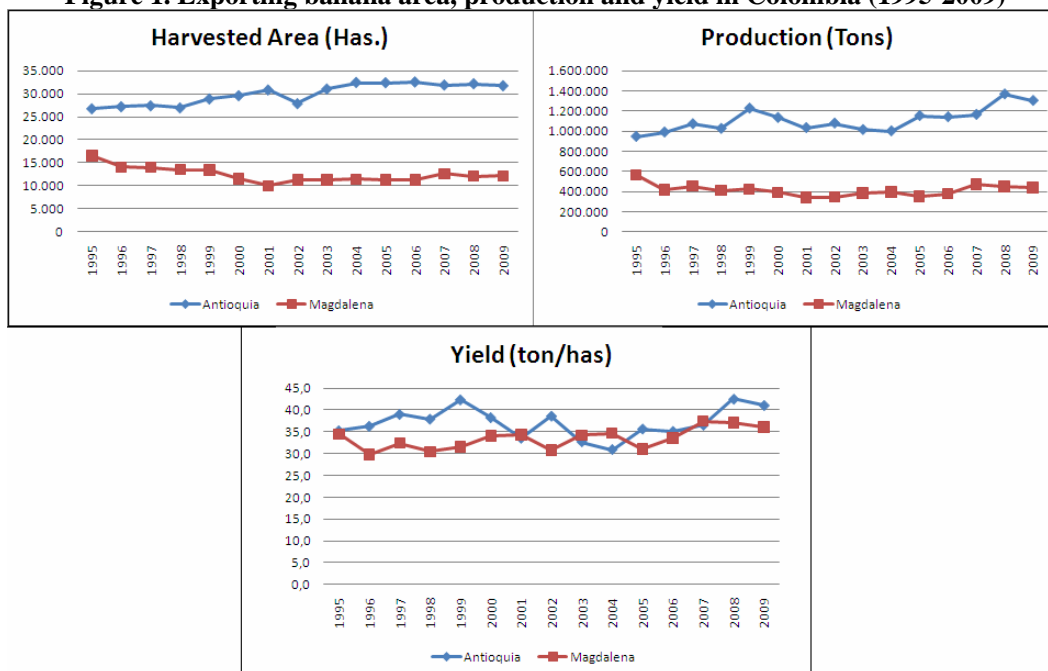
¹ This case study is available as document CCP:BA/TF 11/CRS 9, was prepared by Dr Jahir Lombana, Researcher at the Business School in the Universidad del Norte, Barranquilla, Colombia.

structures of the Colombian banana industry and recommends ways of improving added value, income and welfare for smallholder producers.

A. BANANA PRODUCTION AREAS

9. Bananas are produced mainly in Urabá (Antioquia), which became the most important region for banana production in 2009 (32 000 ha. producing 1.3 million tonnes) and Magdalena, where smallholders are concentrated. Smallholder banana production has significantly declined since the mid 1990s, as they diversified to other crops². In Magdalena, the area under bananas is currently 12 000 ha producing 410 000 tonnes. Average yields are higher in Urabá (41 tonnes/ha) compared to 33.5 tonnes/ha. in Magdalena (Graph 1), mainly due to prevailing market structures, applied technologies and climate conditions. In particular, climate conditions in Magdalena promoted the spread of Black Sigatoka and Moko diseases, constraining output as smallholders struggled to meet the high cost of fumigation necessary to control these diseases, in addition to the already high cost of labour which remains the highest operating costs, as the industry is labour-intensive.

Figure 1. Exporting banana area, production and yield in Colombia (1995-2009)



Source: Estimates based on AUGURA.

B. FACTORS AFFECTING THE MARKET FROM 1995-2010

10. The main agents of cohesion in the banana industry in Colombia are guilds (workers' unions) and Government. Significant changes recently were influenced by occurrences over three distinct periods (1995-1998; 1999-2002; 2003-2010). From 1995-1998, civil unrest and the associated turmoils constrained production, exacerbated by unfavourable weather conditions which required the Government to provide financial support through (FINAGRO)³. However, this measure impacted smallholders negatively because it was not accompanied with effective

² Details in CCP:BA/TF 11/CRS 9.

³ Fondo para el Financiamiento Agropecuario – FINAGRO (Fund for Financing the Agricultural Sector) is the bank of resources in the agricultural sector. Bananas are particularly benefited from their services, however, the intermediation of commercial banks results in an obstacle, since they ask for guarantees that producers do not have.

technical support. For exporters, the tax rebate (CERT⁴), although effective in supporting exporters, was in breach of Colombia's WTO commitments on export subsidies.

11. From 1999-2002 the guild (AUGURA⁵), which addressed social and environmental issues (through BANATURA⁶), strengthened considerably. Incentives for conversion to other products were introduced to Magdalena producers, and those who continued growing bananas were advised to buy climate risk insurance. However, in Colombia where banks are private sector owned, farmers have little access to insurance. It has been suggested that FINAGRO could be expanded to provide access to credit and insurance for producers.

12. Finally, from 2002-2010, turmoil was no longer the major concern of stakeholders, rather the exchange rate was. The continued appreciation of the peso impacted negatively on the returns along the supply chain of what was essentially an export-oriented industry. Subsequently, the industry became less competitive viz. a viz. other banana exporting countries in the region and despite the growth in export volumes, producers and traders claimed losses. The strategy to overcome this negative impact has since been to increase productivity, and CENIBANANO (the guild's agency for research)⁷ has been used to promote scientific research geared at increasing productivity.

C. EFFECTIVENESS AND EFFICIENCY OF THE SUPPLY CHAIN

Costs structure in production

13. Cost of banana production (COP) data in Colombia are difficult to obtain for obvious proprietary reasons, as well as varying scales of production. Espinal, (2005: 39) estimated COP for a farm of less than 5 hectares in Magdalena to be approximately USD 3.17 per box (productivity of 1 664 boxes/ha/year), while a farm of 100 hectares had a COP of USD 3.5 per box (productivity of 1 921 boxes/ha/year). In 2001 the cost of a box of bananas in Urabá was estimated at USD 3.83.

14. Viloría (2008), quoting a study by the Banco Agrario de Colombia, estimated the COP per tonne at 778 226 pesos for an average production of 20 tonnes/ha (1 103 boxes/ha/year). The Banco Agrario concluded that banana growers could break even with a production of about 22.8 tonnes per hectare (1 257 boxes/ha/year). Other estimates quoted by Viloría concluded that the production of 2 600 boxes/ha/year could be considered a reasonable return.

15. The major COP comprise cultivation and harvesting costs, reflecting the labour⁸ component of these elements, while the cost of fertilizers declined, significantly after 6 months, in the production cycle (Figure 2). The wages of labourers in the banana industry are higher than the minimum wage in Colombia. Conventions between workers through their guild and other agents

⁴ *Certificado de Reembolso Tributario* – CERT (Tax Rebate Certificate) has been the most widely used financial tool to support non-traditional exports from Colombia. The mechanism is the return of indirect taxes and contributions (total or partially) based on the value of exports. Exporters should demonstrate the repayment to the country of the amount exported, taking into account the destination and the payment date of shipment according to rates defined by the government (Espinal, 2005).

⁵ AUGURA with 97.5 percent representation in area (39 176 hectares) and 96.3 percent by number of producers (234) is the industry's most important guild in Colombia.

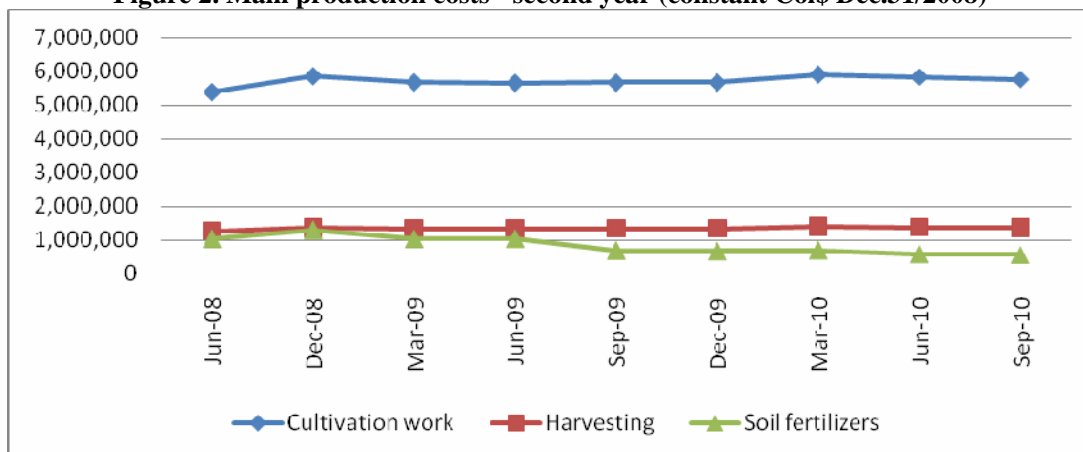
⁶ Program of social and environmental management for the banana sector. The program started in 2001 with 20 pilot farms in the region of Urabá.

⁷ Center for Research on Bananas – CENIBANANO created in 1985 by AUGURA, has as a research agenda: 1) Phytoprotection, physiology and nutrition, 2) Soil and precision agriculture and 3) Environment.

⁸ Work force is still an important variable in the sector. The wage of banana workers has been consistently above the minimum wage. For example, by 2010, while a banana worker received Col\$ 566 857 (USD 277), the minimum wage in Colombia was Col\$ 515 000 (USD 252). However, as the wage of banana workers depend on a two-year agreement, usually the increase over the legal minimum wage is favorable for the first year, but it is not for the later.

in the supply chain include an agreement on salary and other benefits, mainly social. The decline in the cost of inputs, including fertilizers, is associated with declining oil prices⁹ as well as the appreciation of the peso against the USD. Inputs (e.g. fertilizers and agro-chemicals) are mostly imported in USD. It should also be noted that although the cost of fumigation¹⁰ and that of drainage are important variable cost components, data are not readily available¹¹.

Figure 2. Main production costs - second year (constant Col\$ Dec.31/2008)



Source: Estimates based on SIPSA.

Configuration and transactions in the supply chain

16. Farms in Urabá are largely medium to large, while those in Magdalena are mainly smallholders (Table 1). Export farms are certified for quality, environmental management and, increasingly, for good agricultural practices (Global GAP). Medium to large producers represent 25 percent of producers and occupy 85 percent of cultivated area, while smallholders account for 75 percent of all producers and 15 percent of cultivated area (Villalobos, 2008).

Table 1. Growers Distribution in Magdalena (2008)

Farm size	Number of growers 2007 ¹	Number of growers 2008 ²	Area (ha) 2008 ²
Less than 1 ha	491	19	13
Between 1 and 5 ha		475	1 102
Between 5 and 10 ha	148	100	724
Between 10 and 20 ha		55	812
Between 20 and 50 ha	101	45	2 405
Over 50 ha		77	7 200

Sources: ¹ ASBAMA. ² AUGURA.

17. Banana smallholders participate in an oligopsony, where 10 trading companies purchase bananas from 243 growers (Table 2). Trading companies buy bananas from cooperatives representing smallholders, which guarantee a standardized product. Traders in turn provide technical and financial support to producer members of the cooperatives.

⁹ Prices of imported inputs in the banana industry are highly associated to oil prices and dollar's exchange rate.

¹⁰ In areas with high susceptibility to black Sigatoka, should be made up to 36 sprays per year.

¹¹ Villalobos (2008) did an analysis of production costs in the region of Magdalena. Her analysis finds that the drainage and spraying are the major cost components in the area.

Table 2. Links between growers and traders (2010)

Trading company	Number of Growers	Hectares	Growers (percent)	Hectares (percent)
MAGDALENA				
INDEPENDENTS	6	55	2.47	0.14
C.I. TECBACO S.A	14	1 102.49	5.76	2.74
C.I. BANARRICA S.A	4	377.55	1.65	0.94
C.I PROBAN S.A	41	2 497.82	16.87	6.22
C.I CARCAS LTDA	3	30.15	1.23	0.08
C.I BANACOL S.A	11	2 248.30	4.53	5.60
C.I LA SAMARIA S.A	1	123	0.41	0.31
Total Magdalena	80	6 434.31	32.92	16.02
URABA				
INDEPENDENTS	1	83.41	0.41	0.21
C.I. TROPICAL S.A	11	2 752.16	4.53	6.85
C.I. COINDEX S.A.	3	638.91	1.23	1.59
C.I. BANARRICA S.A	2	123	0.82	0.31
C.I UNIBAN S.A	87	15 169.51	35.80	37.76
C.I PROBAN S.A	18	1 182.30	7.41	2.94
C.I CONSERBA S.A	14	1 439.87	5.76	3.58
C.I BANAFRUT S.A	13	3 344.84	5.35	8.33
C.I BANACOL S.A	12	8 346.06	4.94	20.78
C.I. BANUR S.A.	2	654.95	0.82	1.63
Total Urabá	163	33 735.01	67.08	83.98
TOTAL	243	40 169.32	100.00	100.00

Source: Estimates based on AUGURA. By 2010 UNIBAN bought PROBAN's interest and in February 2011, BANASAN bought BANACOL's interest in Magdalena.

18. Some trading companies are also producers, though numbers have fallen over time, concentrating on their core business and leave the production risk to independent producers.

19. Using COP estimates and a proxy for FOB price by dividing export volume by value, estimates of the 2008 and 2009 production cost and trading prices (FOB) are compiled in Table 3 held in constant 2000 USD.

Table 3. Colombian banana prices: production and FOB (constant USD 2 000)/kg

	2008	2009
Average cost of production	0.0986	0.0912
Implicit price FOB	0.3030	0.3262

Source: Estimates based on AUGURA statistics and MADR- Agronet statistics.

20. The price relationship between producers and traders shows the producer share ranges between 30-35 percent of the FOB price received by the trader. However, the producers share (in

terms of the portion of the final price) contracts as the product moves along the value chain to the final consumer. International prices are determined by consumer demand in the destination countries which puts pressure on negotiations along the chain back to the producer. Exceptions to the pressure on costs/prices paid to producers could be in the structures of organic and fair trade. Organic production in Colombia is taking the same course as conventional production with few traders and many potential producers. Concerning fair trade production, there is no valid and sufficient information to draw definitive conclusions. Fair Trade producers are still dependent on conventional trade and traders still buy the bulk of production. It seems that the demand for organic bananas and fair trade is still not representative for traders but it is becoming more interesting.

D. ANALYSIS OF THE INSTITUTIONAL ARRANGEMENTS IN THE COLOMBIAN BANANA INDUSTRY

21. Traders control the links in the supply chain between producers and importers through the provision of inputs required by smallholders to packaging and transportation. Significant support to producers is made by AUGURA, which promotes inter-agency arrangements and CENIBANANO which provides essential scientific support, especially to smallholders who generally find it difficult to keep up with the evolving technology. Cleaner production and irrigation programmes are envisaged to be among the research priorities of the sector. Other programmes, such as BANATURA, REPCar¹² and PPP alliance¹³, also provide support to producers, particularly to smallholders.

22. Financial support is provided by the State, but lacks some key components. Small producers typically require more time to recover from crises than large ones, and this should be taken into account in the provision of credit and insurance. FINAGRO has different funding lines, but not all producers are aware of them, something the guild could assist in disseminating. Commercial banks could also be encouraged to support Government with the provision of micro-finance and micro-insurance.

23. Finally, apart from the support received through CERT, exporters need a financial mechanism to reduce exchange rate risks, which became a priority since 2002. There have been several proposals put forward to stabilize exchange rates, from fixing the exchange rate to the establishment of a stabilization fund to reduce exposure to exchange rate fluctuations.

24. The dependence of small-scale farmers on the prevailing market structures is impacting on their quality of life and needs changing. Diversification to other agricultural products could be a viable option, but choices are limited. Product diversification could also be an option, but attempts in the past have failed, not because of the diversified products themselves but the institutional support required to successfully implement the programmes. Greater empowerment is required of producer associations, as well as targeting potential commercial alternatives outside the traditional norms of the conventional market.

¹² Reducing Pesticide Runoff to the Caribbean Sea.

See: http://www.augura.com.co/index.php?option=com_content&view=article&id=36&Itemid=57

¹³ Public Private Partnership – PPP to "reduce the vulnerability of small-scale banana and plantain growers of Magdalena and Urabá, to increase its competitiveness and generate them employment opportunities and additional income in the context of sustainable development.

See: http://www.augura.com.co/index.php?option=com_content&view=article&id=33&Itemid=54

III. INSTITUTIONAL ARRANGEMENTS AND ECONOMIC BENEFITS OF SMALLHOLDER TROPICAL FRUITS PRODUCERS IN CHINA

A. MARKET STRUCTURE AND INSTITUTIONAL ARRANGEMENTS

25. The tropical fruit sub-sector in China is dominated by small scale producers and traders. The average farm size in the main producing areas such as Hainan is about 3 Mu (0.2 hectare). Redistribution of agricultural lands under the reforms of the early 1980s was based on the size of each household (about 1.7 Mu (0.1 hectare) per member of the household). The strategy of pursuing self-sufficiency in basic foods further reduced areas dedicated to fruit production.

26. A feature of the tropical fruit market is that demand is largely for fresh fruits based on consumer preferences. As smallholders lack financial and technical capacities to store and transport fresh fruits, most tropical fruits are sold and consumed locally. Transaction is by direct negotiation without contract or institutional arrangements and is almost exclusively based on cash between producers and traders.

27. Economic growth in recent years have increased off-farm jobs which resulted in labour migration to urban areas, enabling existing farmers to expand their farm size. To increase production efficiency and avoid abandonment of farm lands, the Government introduced administrative and financial measures to promote production specialization and scale expansion. Hence, farmers are able to expand their holdings by leasing from other farmers. In order to add value in the supply chain, the Government provided financial incentives to encourage integration between farmers and marketing/processing firms, through tax exemption on profits, low interest loans and land use fees, as well as grants as start-up fund if a business entity will engage in tropical fruit production, marketing and processing with local farmers.

28. Based on ownership and contractual obligations, there are three popular business models in the Chinese tropical fruit sub-sector:

- An independent marketing firm to contract products with individual farmers and/or cooperatives. This is a typical arrangement of contract farming, where responsibilities and liabilities are specified in the contract. Cost of compliance is high and price volatility has a considerable impact on the execution of the contract;
- A marketing firm and farmer corporation enter as a joint venture, in which the ownership is determined by the initial investment made by all parties; and
- Thirdly, an agri-business entity, which rents land from farmers. The rent is determined by output averaged over 3 years and the lease period can be between 10 and 30 years. Farmers who have leased their land have priority to work for the firm on a salary.

B. IMPACT ON THE ECONOMIC INTEREST OF PRODUCERS

29. To examine the impacts of different institutional arrangements on the economic benefits of tropical fruit farmers, information was collected on several tropical fruit business models in Sanya County, Hainan Province, where 30 percent of its arable land is used to produce tropical fruits and vegetables. In 2009, the county had about 11 000 ha of tropical products with an output of 140 000 tonnes and around 10 000 ha for vegetables with an output of 250 000 tonnes.

30. The Sanya Tianfen Tropical Fruit Company was established in 2008 when a local marketing firm and several scientists formed a business entity to rent 2 500 mu (167 ha) to produce mango, lychee and papaya. The company employs 105 farm workers, 28 marketing staff and 8 researchers. During its 3 year operation, it opened its marketing office at the fruit wholesale market in Beijing, Shanghai, Guangzhou and Chongqing and sold nearly 75 percent of its output to these markets (another 20 percent was sold directly to other provinces and less than 5 percent was sold at the local market). Price realised for their produce sold in markets outside Hainan was 150

percent higher than that realized in the local market. To meet the expanding demand from its markets, the company purchases tropical fruit from individual farmers in the county. In 2009, it sold about 18 000 tonnes of tropical fruits and vegetables to its 4 large city markets for a total revenue of around RMB 170 million (about USD 25 million).

31. This model achieved production and marketing efficiency because it was run as an independent firm with minimal transaction costs compared with other models. The institutional arrangement is also simple, and only involves rents to farmers who are leasing their land. Farmers receive a fixed income based on land rents and are not exposed to market risks.

32. The second model involves Sanya Nanguo Firm/Grower Corporation, which was established in 2007 with 6 households and has now expanded to about 300 households in 5 villages. At its initial stage, the corporation engaged in production only, but has since established three marketing offices in Beijing, Hangzhou and Chongqin, with its own brand. In 2009, it had an output of about 15 000 tonnes and a revenue of RMB 145 million (USD 22 million). All members are shareholders with individual shares based on initial investment (land and cash), details of which were not disclosed to the Secretariat. The corporation is managed by hired professional managers.

33. Given the institutional set up, all the shareholders enjoy the economic benefits from the business success of the corporation. However, functioning of the corporation is quite complicated because any major decision must be approved by all the members. Luckily most members trusted the founder of the corporation and usually endorsed his decisions, otherwise it would be very difficult to reach a unanimous agreement.

34. While these two business models have been established in Sanya county, other traditional production and marketing models are still popular; direct sales and contract farming. For comparison, selected data for these two types of traditional model were also collected. Table 4 summarizes the institutional arrangements and economic consequences for four business models.

Table 4. Yield, sale price and revenue of selected tropical fruits under different organizations

	Unit	Individual direct sale	Contract sale	Member owned	Enterprise
Average yield					
Lychee	Kg/Mu	386	378	488	526
Hami Papaya	Kg/Mu	2 870	3 105	3 750	4 286
Average price	Rmb/kg				
Lychee	Rmb/kg	3.64	3.32	7.4	7.64
Hami Papaya	Rmb/kg	1.85	1.68	2.78	2.66
Average household					
Revenu	Rmb	6 715	6 471	14 036	700 ¹
Net revenue	Rmb	3 246	3 068	9 374	12 000 ²
Evaluation					
Institutional arrangements		No	Contract	Ownership + contract	Rental lease
Market risk		High	High	Mild	Low
Transaction costs		No	High	High	No
Long term benefit		No	Low	High	No

Note: All data were for 2009

Net revenue is the one after deducting transportation and marketing costs.

¹ Yearly rent/mu.

² Yearly average off-farm salary.

35. Organized farmer groups achieve higher returns because of better market reach. These groups obtained higher yields due to their specialization and economies of scale. While this model attained the highest production and marketing efficiency, the individual farmer did not enjoy any benefits derived from the growth of the enterprise. However, unlike the other forms of business models that faced market risks, farmer that rented their land did not face these risks but enjoyed steady income levels from their rents.

IV. CONCLUSION

36. Various institutional arrangements between farmers and marketing firms essentially reflected market participation by the farmer over the supply chain. Generally, the greater the participation, the greater the economic benefit to farmers because it allows more value-addition created over the chain. The corporation can create better economic efficiency and return because it allowed farmers to achieve scale economy and extend their market reach. However, optimal entrepreneurship is essential to the success of corporation. In fact similar type of corporations have collapsed in Sanya due to poor management. Therefore, institutional arrangements should ensure economic efficiency in the value chain through better cooperation among members and leading to reduced transaction cost, while distributing profit among members fairly.

37. There should be consensus building and understanding of the institutional arrangements once they have been set up. If members do not understand these arrangements, benefits and responsibilities, transaction costs could be unacceptably higher. In general, when there are new rules or policies to be set up, it should fully consider the ability of members to accept.

38. This case study also suggested that institutional arrangements should be based on the market and most appropriate business practices. The Government can have a role in setting up the framework of these arrangements and provide incentives to ensure smallholders receive fair representation. In China, the Government has set up the cooperation law for farmers, provided financial stimulus to encourage the establishment of farmer cooperation and the development of "Leading Firm". All these influence institutional arrangements in various business models.

39. The analyses of the roles of institutional arrangement in the business models of this case study are static and preliminary because the major cooperation and integration models have only emerged in the last 3-4 years. To fully understand the effects of the institutional arrangements of these models on small farmers, in particular to quantify the effects, a dynamic analysis of the performance of these models is required.