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ASSESSMENT REPORT - MOBILE SOLUTIONS FOR COCONUT SUGAR PRODUCERS IN BENGKULU PROVINCE

Indonesia | April 8, 2016 | Prepared for Grow Asia

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A. Executive Summary

This assessment took place in Bengkulu, Sumatera, Indonesia and focused on coconut sugar producers in three municipalities: North Bengkulu, Seluma and Kaur. Three methodologies were used in this research: Survey interviews with 220 coconut sugar producers, Focus Group Discussions (FGDs) with 41 participants and in-depth interviews with 15 value chain actors. The assessment team experienced certain challenges during the data collection period in finding the 240 target respondents. This was primarily due to an overall decrease in the number of coconut trees: From 2008-2015, coconut tree plantation has decreased 19.3% (equal to 1,552 hectares). Furthermore, each year there has been a reduction in the number of new coconut sugar producers, and a replacement of coconut sugar production with palm wine production.

This assessment report investigates the current state of the coconut sugar value chain in Bengkulu, along with an analysis of the barriers for mobile technology faced by coconut sugar producers. While there are complex factors at play, the assessment concludes that the main barriers are: 1) Low connectivity in certain parts of the target areas, 2) Low technological literacy, and 3) Resistance to paying for mobile services.

Feedback from coconut sugar producers indicates that producers need formal financial services, quality seedlings, technical guidance on coconut tree care, and access to training on effective coconut sugar production, with particular emphasis on how to increase productivity and improve quality. A holistic approach should be considered for interventions that seek to address these market barriers. Enabling better access to information and market prices would be an important step in stimulating the motivation of producers to increase their productivity. Strong leadership and self-organization would allow producers to gain trust from stakeholders; access to the broader coconut sugar market; and would create a platform for training, capacity building, and accessing financial services.

B. Bengkulu at a Glance

Bengkulu Province is located on the western coastline of Sumatera Island directly facing the Indian Ocean, with a total population of approximately 1.8 million people. The population is distributed unevenly, with Bengkulu City, North Bengkulu and Rejang Lebong Regency accounting for more than half the total population. As of March 2015, the poverty rate was 17,88%[1] and ranked 20th in 2014 on the Human Development Index (HDI)[2]. The main livelihood is agriculture, with income coming from products such as spices (ginger, nutmeg and pepper), bamboo shoots, palm oil, rubber, coconuts, and coffee. Other sources of income are derived from three active coal mining companies that export nearly 400,000 tons of coal per year to Malaysia, Singapore, South Asia and East Asia. Fishery is another important economic activity, in particular tuna and mackerel. [3]

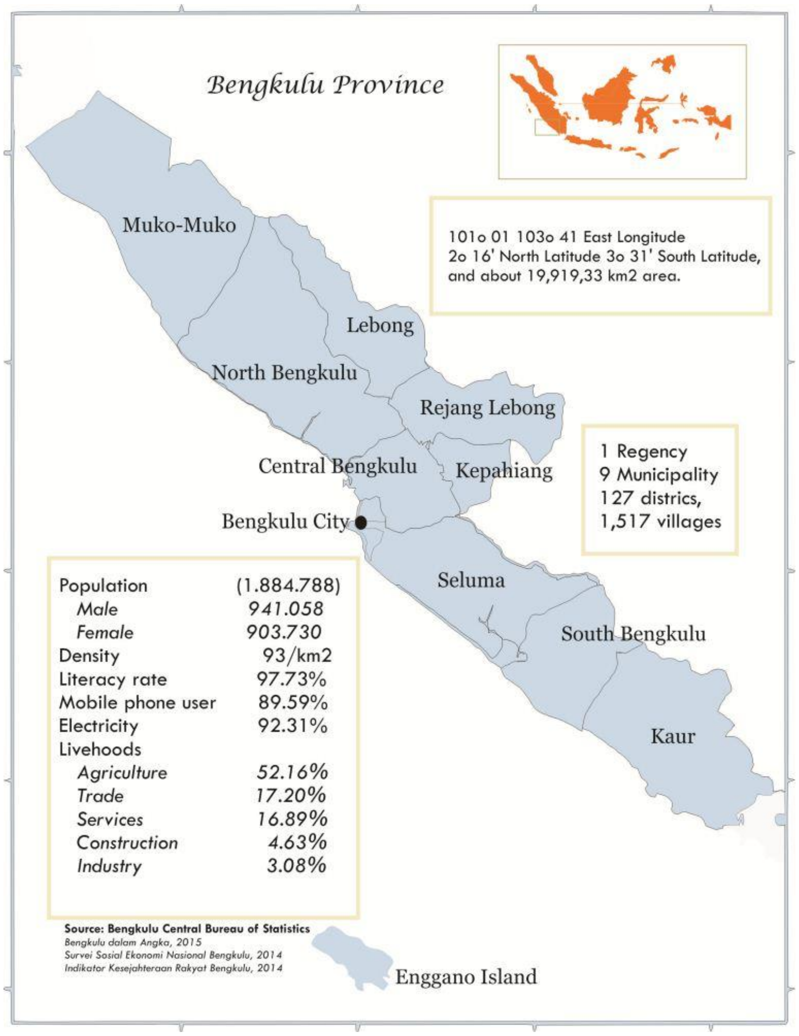


Figure 1. Map of Bengkulu Province

1 Berita Statistik BPS Bengkulu, No. 55/09/17/Th.IX, 15 September 2015

2 http://bengkulu.bps.go.id/linkTabelStatis/view/id/222

3 https://en.wikipedia.org/wiki/Bengkulu#Economy

C. Background and Objectives

This report analyzes the coconut sugar value chain in Bengkulu Province by observing different supply chain models in North Bengkulu, Seluma and Kaur. Coconut sugar is a critical ingredient for the production of sweet soy sauce. Indonesia holds an important role as one of the largest coconut sugar producers in the world, second only to the Philippines. Grow Asia and Unilever selected Bengkulu as the research area due to its significant supply potential given the abundance of coconut tree plantations along its coastal regions. The objective of this research is to develop a better understanding of farmer needs and how they can be met through mobile technology, as well as an overview of what solutions exist or need to be created. Unilever intends to use the findings of the research to determine how to use mobile technology to enhance the livelihoods of smallholder farmers by helping them to become more sustainable and efficient, increase their access to markets, reduce transactional costs, enhance the traceability of raw materials, drive loyalty and secure supply chains for companies such as Unilever.

D. Research Methodology

The methodology was based on primary source data collection, including interviews with coconut sugar producers and value chain actors. The three methods were:

- **Survey interviews with coconut sugar producers** – Survey interviews were used to capture the process of coconut sugar production and identify barriers and challenges faced in access to finance and information and mobile usage and demand for mobile solutions.
- **Focus Group Discussions (FGDs) with coconut sugar producers** – The FGDs utilized semi-structured questionnaires to discuss issues and concerns on several key questions to verify and validate findings from the survey interviews.
- **In-depth key informant interviews (KIIs) with value chain actors such as collectors, buyer-aggregators, retail merchants, government stakeholders, staff from Bengkulu University, Mobile Network Operators (MNOs), and mobile agriculture platform providers:** Key informant interviews were utilized to gain in-depth information on the roles and relationships with coconut sugar producers, validate their support and payment methods, identify barriers, and needs and challenges on mobile solutions.

Mercy Corps conducted a preliminary visit to Bengkulu from January 20 - 22, 2016 prior to conducting the interviews, with the objective of introducing the assessment to several key people including representatives from the Bengkulu University, the Provincial Office for Industry, Trade, Cooperatives and SMEs, collectors and coconut sugar producers.

The research covered three municipalities: North Bengkulu (107 producers), Seluma (109 producers) and Kaur (4 producers) with a total of 220 coconut sugar producers surveyed.

Figure 2. Research Areas

The initial target for number of respondents was 240 people, but the final number ended up being 220 respondents. We learnt that our target subset areas, **Lokasi Baru, Sumber Rejo, and Purbosar**i, used to have bigger numbers of coconut sugar producers a decade ago, but the numbers have decreased for several reasons:

- There has been a decrease in the number of coconut tree plantations, with a change to palm oil and rubber in recent years (Ibu Kasih, a collector from Lokasi Baru village, mentioned that there were approximately 50 to 60 coconut sugar producers in that area 10 years ago. Currently, there are only six producers left to continue producing the coconut sugar. Another case from Sumber Rejo village revealed that producers are mostly renting their coconut trees from Pal 30 village due to the lack of coconut trees in the past 15 years).
- A new generation of the labor force is pursuing other livelihoods outside of agriculture crop production (Note taken from in-depth interview in Lokasi Baru and Purbosari villages).
- An increasing number of producers are now sapping the coconut trees for palm wine (tuak), which is less intensive work compared to coconut sugar production (This was reported in Lokasi Baru, Purbosari and Pondok Kelapa villages).

The survey used an android-based mobile application called "Kumpul Data"[4], which is able to take pictures of respondents and document the GPS locations of their addresses. This process is a first step towards addressing traceability required by Unilever in identifying the source of origin of coconut sugar.

Respondent Profile

Name	Sudarto
Village	Lokasi Baru
Sub-District	Air Periukan
District	Seluma
GPS	-3.97927366,102.41964745
Sex	Male
Age	50
Education	Middle School
Telephone	0856882619

Figure 3. Sample of Respondent Profile captured by the "Kumpul Data" Application

[4] Developed by PT. 8villages Indonesia and supported by Mercy Corps

Details of districts and villages covered in this research (including gender disaggregation) can be seen in the table below.

Table 1. Research Areas and Surveyed Respondents

Municipality (Kabupaten)	District (Kecamatan)	Village (Desa)	# Male	# Female
KAUR	Semidang Gumay	Cahaya Batin	2	0
	South Kaur	Pengubaian	2	0
SELUMA	Air Periukan	Lokasi Baru	2	2
	Ilir Talo	Mekarsari	18	6
		Penago 2	32	20
		Rawa Indah	1	0
	West Seluma	Purbosari	19	7
	East Seluma	Rawa Sari	0	1
		Tenangan	1	0
NORTH BENGKULU	Lais	Durian Daun	7	2
		Pal 30	30	24
		Tebing Kandang	2	0
	Air Besi	Kota Agung	1	0
	Air Napal/Kerkap	Lubuk Tanjung	3	2
		Pasar Bemba	1	0
		Pasar Kerkap	4	6
		Pukur	1	0
		Tepi Laut	4	3
	Hulu Palik	Sumber Rejo	7	5
	Padang Jaya	Marga Sakti	3	2
TOTAL			140	80
			220	


Figure 4 - 5. Interviews Utilizing the "Kumpul Data" Application

Focus Group Discussion Coverage

There were five (5) Focus Group Discussions (FGDs) conducted with a total of 41 producers participating in the discussions.

Breakdown of Participants for Focus Group Discussions:

- FGD 1 – North Bengkulu / Female (five)
- FGD 2 – North Bengkulu / Male (ten)
- FGD 3 – Seluma / Female (ten)
- FGD 4 – Seluma / Male (thirteen)
- FGD 5 – Kaur / Male (three)

Figure 6. FGD with Female Producers (Mekarsari)

In-depth interviews took place in Bengkulu City and Jakarta to gain information from 15 value chain actors on their specific roles related to coconut sugar producers, including collectors, retail merchants in local markets, local government officials, mobile network operators and mobile agriculture platform providers (see "Annex 1. List of Contacts for Value Chain Actors").

Figure 7. In-depth interview with Merchant

Figure 8. In-depth interview with Collectors

E. Profile of Coconut Sugar Producers

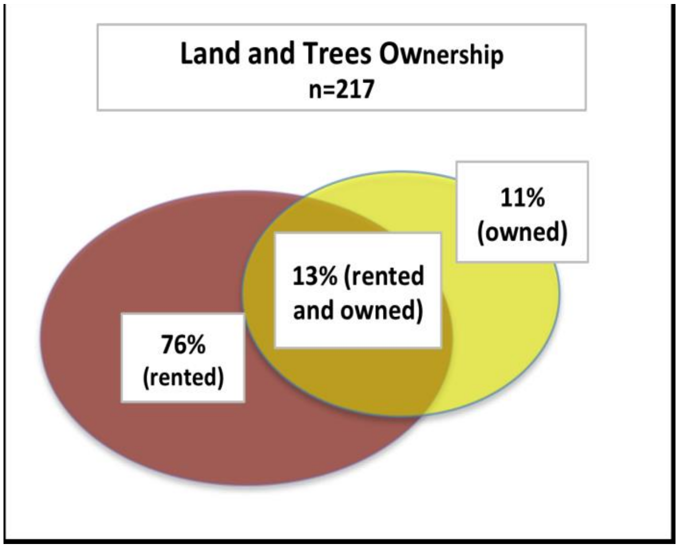
1. Respondent Demographics

94% out of 220 respondents (or 207 people) had some level of formal education, indicating a high literacy rate. The respondents' ages varied between 16 to 65 years old, with the majority in their mid-30s. Only four percent of the respondents were teenagers and ten percent were still working past the age of 60. The average family size of the respondents was four people per household (40%), while the remaining 60% ranged from two to eight members.

2. Ownership and Production of Coconut Trees

There are three kinds of tree ownership, in terms of where the coconut sugar producers get their coconut sap from: (1) From their own coconut trees, (2) From rented coconut trees, and (3) From a mix of their own and rented trees. In North Bengkulu, the majority of coconut sugar producers were renting their sapped coconut trees because there were not enough coconut trees on their land. Many of the producers came to Bengkulu as relatives of collectors and work as sappers for the collectors.

Table 2. Land and Trees Ownership



An average of 31 trees are sapped per respondent, per day. North Bengkulu has the highest average number of sapped coconut trees, with the producers sapping more than 50 coconut trees per day. Seluma and Kaur have an average of 24 and 18 sapped coconut trees per producer per day respectively.

Most of the producers (94%) are processing the coconut sugar on a daily basis; they climb and sap the coconut trees twice a day and then cook the product the following day. A small number of producers (5%) cook the coconut sugar twice a day. It takes approximately 12 hours of work per day to produce coconut sugar, including five hours for climbing to obtain the coconut sap and seven hours to cook and mold the sugar.

North Bengkulu has the highest rate of production, with an average of 16 kg coconut sugar per day, followed by Seluma with 12 kg/day and Kaur with 8 kg/day. The average total production per producer per day is 14 kg. Respondents reported that these numbers were lower than normal production rates due to a prolonged drought season this year, which has impacted the volume of coconut sap.

3. Distribution Channels and Price of Coconut Sugar

There were at least four main types of buyers identified, namely Collectors, Agents/Traders, Local Markets and Others (such as cooperatives and neighbors). Most of the coconut sugar producers (83%) sold their coconut sugar to collectors. All of these buyers conduct cash transactions with no written contracts with the producers. However, two percent of the respondents reported having contractual arrangements in the past but no longer continue the practice. Occasionally, some buyers paid the collectors in advance through bank transfers and then collected the sugar a week later. The price of coconut sugar varied between research areas. The lowest price reported in the survey was IDR 7,500 (US$ 0.6) per kg in North Bengkulu, while the highest price was up to IDR

15.000 (US$1.2) per kg in Seluma. The average price is IDR 10.000 (US$0.8) per kg as reported by 31% of the respondents. From these references, the producer gains approximately IDR 3,6 million per month (US$278), excluding labor costs. The margin depends on the weather, as the price is higher in the dry season. During the survey, there was a case where a producer bought a motorcyle on credit and paid off the installments just from sales of coconut sugar.

Table 3. Annual Production Cost *

Fixed Cost	Annual Cost (IDR)	Annual Cost (USD)
Renting coconut trees	150,000	11.54
Steel Wok	60,000	4.62
Sickle	250,000	19.23
Jerrycan	50,000	3.85
Bamboo Mold	-	-
Scrapper	45,000	3.46
Wooden Stirrer	-	-
Winnowing (Tampah)	8,333	0.64
Plastic Wrap	135,000	10.38
Bailer/ Teapot	180,000	13.85
Stove	100,000	7.69
Firewood	7,800,000	600.00
Chalk (Kapur Sirih)	1,560,000	120.00
Total production cost	**10,338,333**	**795.26**

* The above production cost includes amortization of some materials such stove, steel wok, sickle and jerrycan over the period of their expiration. The calculation excludes labor costs because respondents report only using family labor and do not hire workers.

Table 4. Margin per Month**

Monthly Income	(kg/day x 7 days x average selling price)	IDR 4,480,000	USD 344.62
Monthly Fixed Cost	(annual production cost/ 12 months)	IDR 861,528	USD 66.27
Margin per Month	**(monthly income - monthly fixed cost)**	**IDR 3,618,472**	**USD 278.34**

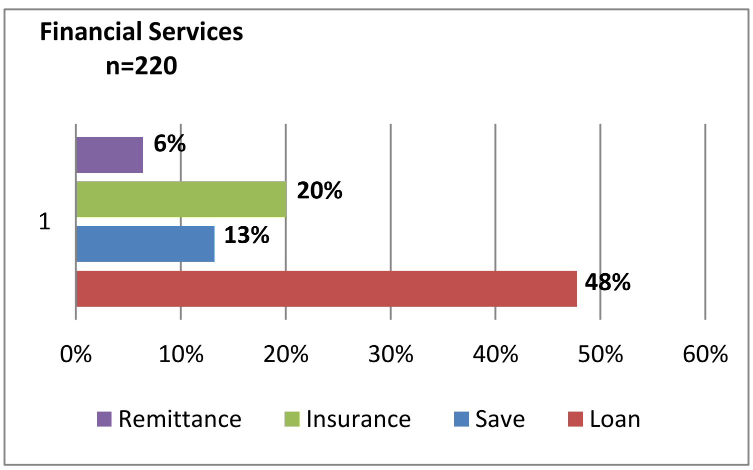
** The above margin has included interest rate (for those producers who have debt with their collectors) that internalized through the lower price from the buyer.

4. Financial Services

In the questionnaire, the respondents were asked about the types of financial services used in the past 12 months, such as savings, loans, remittances and insurance. Savings products were quite low with only 13% of respondents reporting having had access to formal savings products with the remaining respondents reporting informal savings mechanisms.

The number of respondents who report having insurance is quite high at 20%. This was due to intensive government campaigns promoting BPJS (government health care insurance) throughout the country. Of the 20% who reported having insurance, all are BPJS clients. There are no agricultural risk management products available. Respondents reported that remittances were the least used financial product available in the marketplace. This is due to a general lack of availability of such products in the target areas. However, for those that do use remittances, the most common channel for obtaining the product is through the post office.

Table 3. Financial Services



Additionally, loans are an increasing priority for coconut sugar producers: Approximately 48% of the coconut sugar producers have taken loans at some point, but nearly half are taking loans from the collectors to whom they sold their sugar (the average loan size taken by the coconut sugar producers is approximately IDR 4 million (US$308) on an annual basis). This is a mutually beneficial cycle in that producers have access to cash at any point without the need for collateral and collectors receive a steady supply of coconut sugar. However due to the informal and unwritten nature of the agreement, the collectors are often in positions of power that enable them to demand payment from producers for indefinite periods of time resulting in a debt trap for producers (for example, if the producer is taking loan from the collector, he/she will receive IDR 12,000 per kg (US$0.9) and a producer with no outstanding loan from the collector will receive IDR 14,000 per kg (US$.1.1) In this example, the interest rate is 15% per week).

The remaining surveyed producers took loans from banks, and only a few reported instances of receiving loans from family and neighbors. Several respondents mentioned taking a loan product called Kredit Usaha Rakyat (KUR) (government provided interest subsidy) from Bank Rakyat Indonesia (BRI) with an interest rate of 9% per year (sliding) or 0.4% flat per month for up to three years. There are three KUR loan types: KUR Micro (loan amount up to IDR 25 million/US$1.923), KUR Retail (loan amount up to IDR 500 million/US$38.462) and KUR for migrant workers (loan amount up to IDR 25 million/US$1.923), which are channelled through five commercial banks (BRI, BNI, Bank Mandiri, BTN, and Bank Syariah Mandiri) and one regional development bank (Bank Bengkulu). In comparison, commercial loans offered by commercial banks have an average interest rate of 13% per year (sliding) for working capital loans and 15% per year (sliding) for consumer loans.

5. Existence of Producers Organization

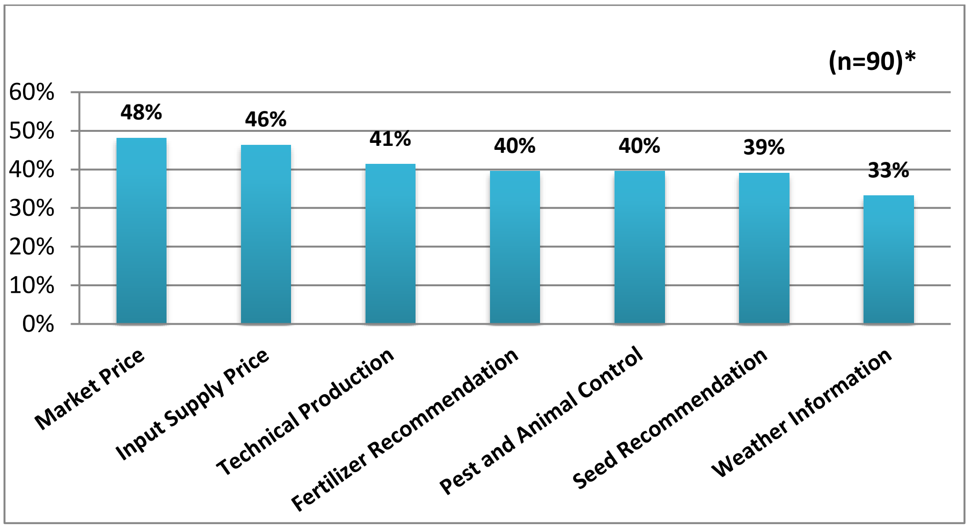
There are not many farmers' organizations among the coconut sugar producers in Bengkulu. Only 18% of respondents said that there were farmer groups or cooperatives in their area, namely Mayangsari, Mekarsari and Koperasi Keliling, but only 12% mentioned they had been members of a farmer group or cooperative in the past. The main reasons for the lack of interest in membership of farmer groups or cooperatives were disappointing experiences with cooperative leaders in the past, complex procedures for accessing loans, and the existence of alternative sources for loans. A few respondents with experience in cooperatives could clearly articulate the advantages of membership, such as increased savings, access to information and access to savings and loan products.

6. Mobile and Information Usage

Out of 220 respondents, 57% (125 respondents) of the coconut sugar producers owned mobile phones. More than half of the coconut sugar producers that owned the mobile phones are capable of texting and making calls, and the majority (90% of the 125 respondents) used Telkomsel SIM cards. The connectivity was very weak in Seluma and Kaur compared to North Bengkulu and the respondents never used any content application or information from their mobile phones. Many respondents reported topping up the airtime or phone credit on a weekly basis for IDR 10,000 (US$0.8) through a warung (small shop) or neighbor.

41% of respondents (90 people) stated that they are willing to pay for mobile services. While this is only a minority of the producers, it should be noted that within this group, the interest in accessing information through mobile channels is very high. The table below provides further information on this.

Table 4. Demand for Different Types of Mobile Information



* n represents the 41% of respondents who are willing to pay for mobile services

7. Access to Training

The demand for training is high, specifically in relation to coconut tree management and other technical skills on coconut sugar processes, but only 5% of respondents reported that they have been able to access training provided by the government. The extension officers from the District office of Industry, Trade, Cooperative and SMEs (Disperindagkop) conduct only two visits per year to register SME practitioners, including coconut sugar producers.

F. Coconut Sugar Value Chain

The following pictures are the steps in the making of coconut sugar.

Figure 9. Steps in the Making of Coconut Sugar

There are four models of how the producers sell their coconut sugar:

1. **Model 1 (Collector #1)**

- The producers sell (daily or three times per week) their coconut sugar exclusively to one collector at the village level without a written contract. The producers receive their payments in cash on a weekly basis.
- The collectors sell the coconut sugar to buyers from other provinces and are paid either through cash or a bank transfer (all seven of the collectors interviewed owned bank accounts).

2. **Model 2 (Collector #2)**

- The producers sell (daily or three times per week) their coconut sugar to more than one collector at the village level. The producers mainly receive their payment in cash upon delivery.
- The collectors sell the coconut sugar to district buyers ("toke") located close to the village and to the local market. The collectors receive payment in the form of groceries while they receive cash from buyers at the local market.
- District buyers sell the coconut sugar to retailers at the local markets and buyers from other provinces. District buyers receive payment in cash or bank transfers.

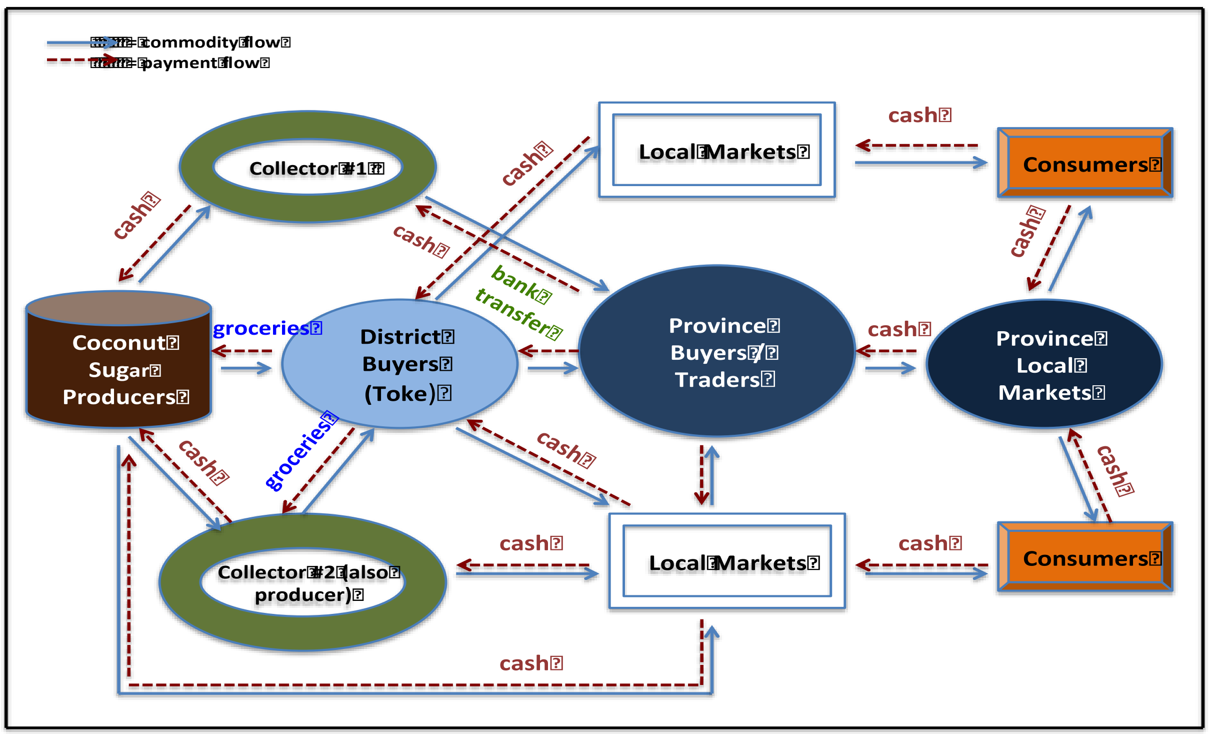


Figure 10. The Coconut Sugar Value Chain

3. Model 3

- The producers sell their coconut sugar to district buyers (toke) on a weekly basis.
- The producers receive payment in the form of groceries.

4. Model 4

- The producers sell their coconut sugar directly to retailers in local markets (on a weekly basis).
- The producers receive payment in cash upon delivery.

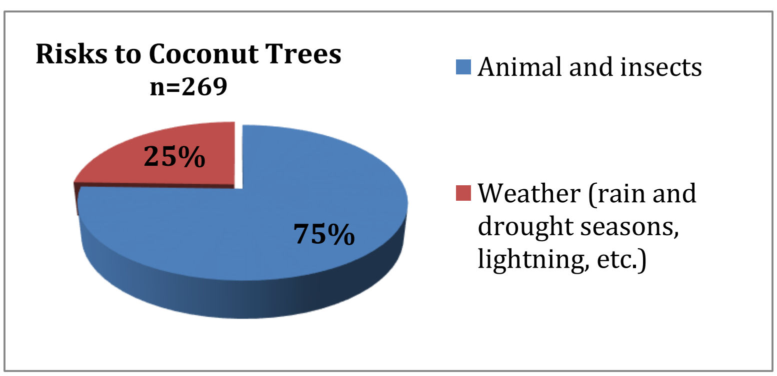
Feedback from the respondents indicated that **98% of the producers were engaged in the first model of selling their coconut sugar directly to the collectors**, particularly in North Bengkulu and Seluma municipalities.

There were two interesting examples taken from the interviews related to informal savings and loan structures. The first was in **Lokasi Baru village (Seluma)**, where Ibu Kasih mentioned that she became a leader of a women's savings and loan group consisting of 10 women, provided by PNPM (National Programme for Community Empowerment/Program Nasional Pemberdayaan Masyarakat) and each group member received loans amounting to IDR 10 million (US$770) for a period of 1.5 years. The current cycle is already in its third iteration. The second case was in **Mekarsari village (Seluma)**, where Ibu Sarmi is a coordinator of ROSCA (Rotating Savings and Credit) also known as Arisan, involving 120 women in three villages close to Mekarsari, Penago Satu and Penago Dua. All members deposit IDR 100,000 (US$7.7) per person per week to Ibu Sarmi. Every week, Ibu Sarmi and other Arisan members will take a name out of a jar containing all member names. The name picked receives IDR 12 million (US$923) and this cycle lasts up to 30 months before a new round starts.

G. Constraints Faced by Coconut Sugar Producers

This section outlines constraints faced by coconut sugar producers taken from the 220 survey respondents and 41 FGD participants. The constraints have been grouped into the five following categories:

Table 5. Risks to Coconut Trees



1. Risks to Coconut Trees

A majority of respondents (75%) mentioned that the main threat to coconut production and trees was from animals and insects, such as monkeys (who throw materials such as jerrycans), squirrels, bees, mice, bats (who drink the coconut sap) and beetles (who eat the coconut flowers and leave holes in coconut trunks). For example, there was a beetle swarm attack several years ago, which caused huge damage to the coconut trees.

It took three months for the coconut trees to recover and be sapped again by the producers. The coconut farmers do not have specific methods for getting rid of animals and pests, nor do they have specific times scheduled for eradication. However, farmers find these infestations very disturbing and will go to extreme measures (such as trapping or shooting) to get rid of them..

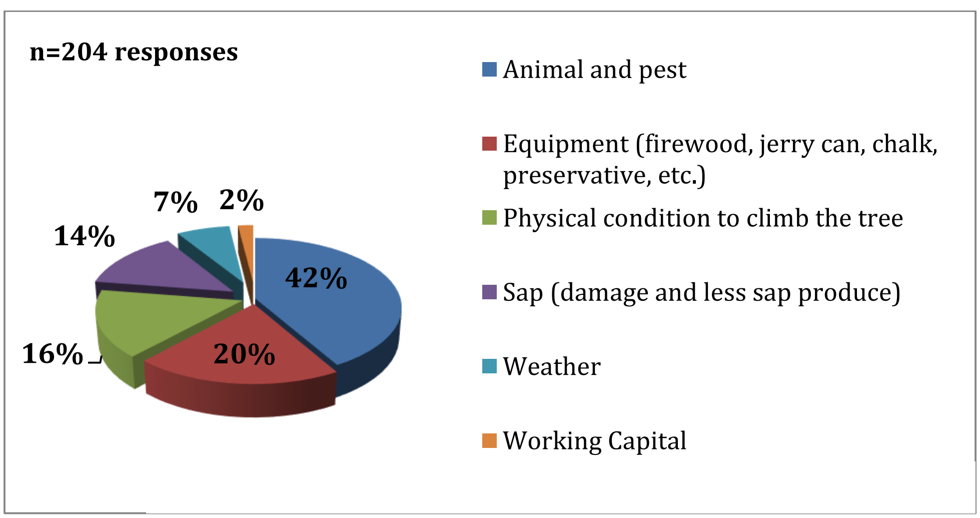
2. Crops Competition

The decrease in coconut tree plantations has been going on for more than a decade. This is mainly for economic reasons, as smallholder coconut farmers perceive other crops (palm oil and rubber) as a better investment over coconut trees. Those crops are also lower maintenance and require less water. Another factor mentioned was the lack of good quality coconut seedlings in Bengkulu. For the past five years, the farmers realized that their coconut trees are getting higher to climb (posing greater risk)) and are producing less sap as the trees get older. There is a high need to replant new trees but there is a lack of availability to procure those seeds.

3. Coconut Sugar Production

Coconut sugar production is highly dependent on good weather for the producers to safely climb the trees as well as to process the coconut sugar, which requires good, dry firewood and kitchens. Heavy rain and drought are one of the biggest challenges in producing good quality coconut sugar. Due to labor intensity and associated risks, the coconut sugar has been significantly replaced by the production of palm wine. The palm wine offers less complicated work with higher selling prices.

Table 6. Obstacles in Coconut Sugar Production



4. **Producers Continuity**

An additional threat to coconut sugar production is the continuity of the producers' engagement in coconut production. In line with the reduction of land, the number of coconut sugar producers is also decreasing. Responses from the farmers revealed that they require more trees to produce more sugar. There are two options for the producers: 1) Acquiring (or renting) more coconut trees, and 2) Leaving their villages to find new bigger coconut plantations. However, both options run some risks related to their existing long-term debt with current collectors, building new trust in new markets, and the requirement of working capital to start up in a new place.

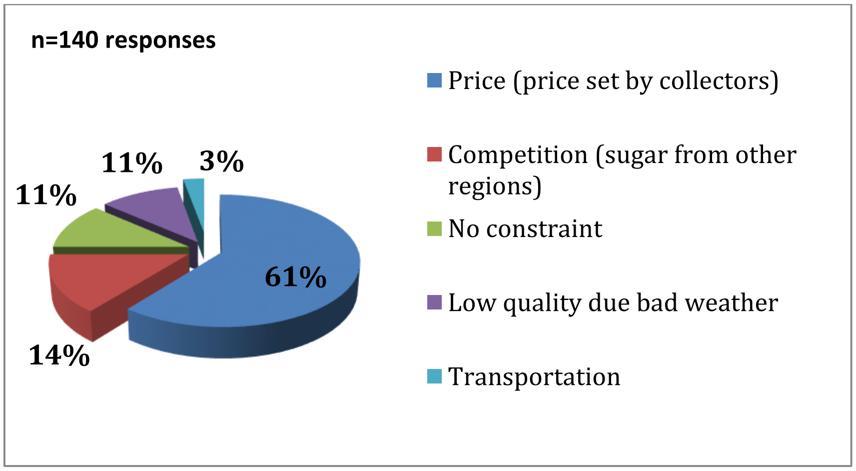
5. **Socio Economic Culture**

This particular issue is looking at the behavior context between 1) new migrants (majority coming from Java) vs local people and 2) earlier migrants (from the transmigrasi program of the 1980s) vs their children in producing coconut sugar. The local people and the children of migrants tend to see this work less favorably because the small income, the physical intensity of tree climbing and the long hours processing sugar are not worth the price. The younger generation is achieving higher education and no longer values the work of sugar processing, it is viewed as basic labor compared to other professions such as civil servants or teachers. Other observations revealed that the youth would only start to produce coconut sugar as their last preference of work and only after they were already married because they view working on coconut as reducing their marriage prospects. Producing coconut sugar also requires a partner and with marriage the full value of the sugar remains within the family.

6. **Sales of Coconut Sugar**

According to the survey, the biggest constraint in selling coconut sugar was obtaining good and stable prices. There were several factors identified resulting in price instability: 1) Competition from other regions, such as the fact that sugar coming from Java and Lampung has lower quality and prices, 2) Seasonality: The price of sugar goes up in Ramadhan and Idul Adha, and 3) Lack of bargaining power: The majority of coconut sugar producers in Bengkulu are in debt for either their working capital or daily needs to the collector/buyer and got lower prices due to their outstanding loan. The average interest rate is around 15% per week regardless of the quality of the coconut sugar.

Table 7. Obstacles in Selling the Coconut Sugar



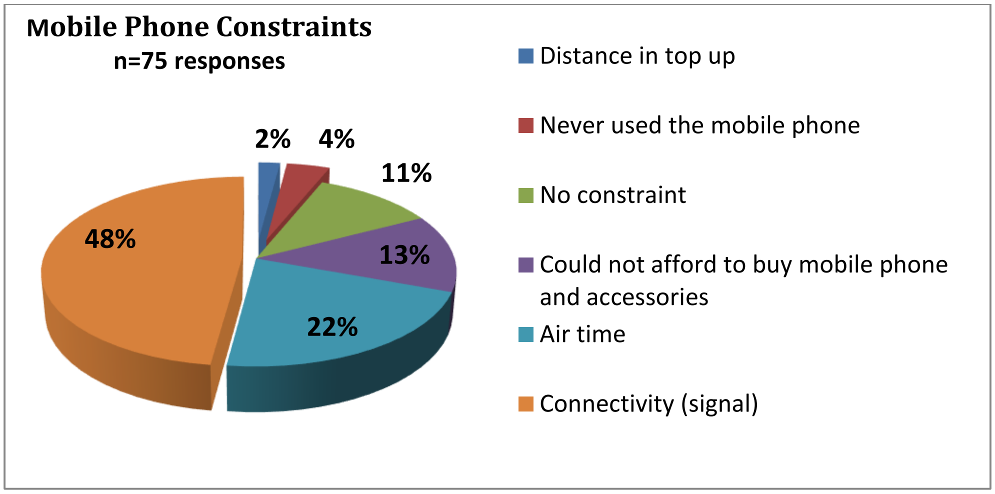
7. Expressed Needs on Information

Coconut trees require little maintenance compared to other plantation crops. The FGD sessions revealed that coconut sugar producers require support accessing quality coconut seedlings (not available in Bengkulu province for the hybrid/dwarf coconut type). From the survey interview, collected data in regards to agriculture information services showed the required rank of services as the following: (1) Market price, (2) Input supply, (3) Technical assistance in production, (4) Pest management, (5) Fertilizer recommendation, (6) Seedlings recommendation and lastly (7) Weather information (see Table. 6 – Demand for Different Types of Mobile Information)

8. Mobile usage

Connectivity was reported as the biggest obstacle in mobile usage for coconut sugar producers. This obstacle was also a significant constraint during the data collection for this assessment, as the mobile application needs a signal to synchronize all data collected in the field. The findings showed respondents only used the minimum functionality of their phone for texting and making calls. The majority still uses a basic phone model, not a smartphone.

Table 8. Mobile Phone Constraints



H. Availability of Mobile Information and Financial Services

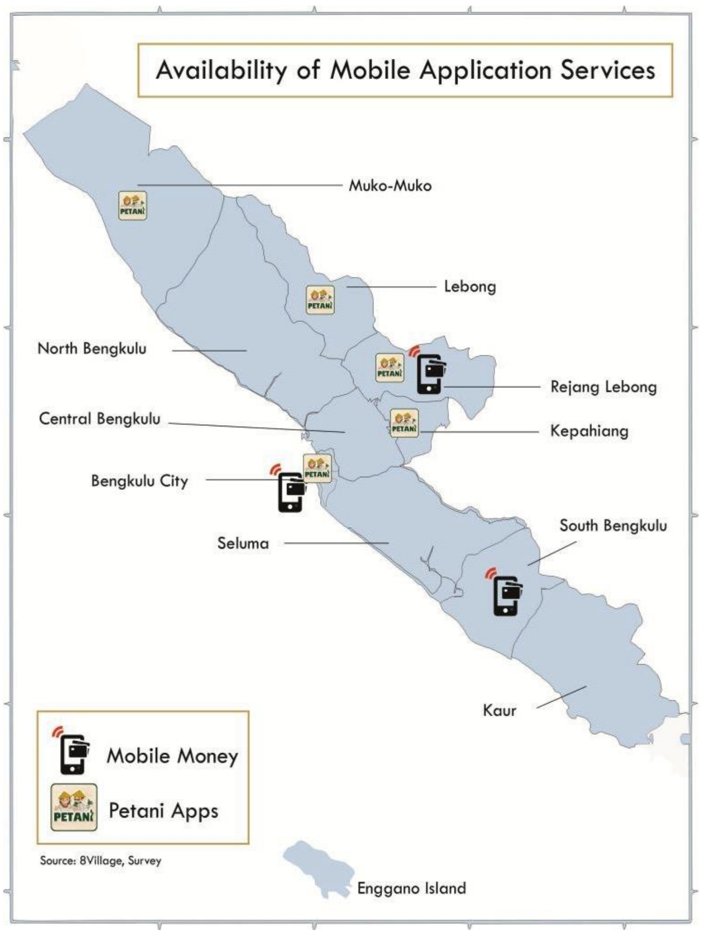


Figure 10. Availability of Mobile Application Services

1. PT.Telkomsel Indonesia

PT.Telkomsel Indonesia is the largest mobile telecommunications operator in Indonesia with nearly 150 million subscribers in 2015. The company offers mobile money called T-Cash and is expanding its merchants nationwide to increase transactions from approximately 15 million users. In Bengkulu, there are three T-Cash outlets serving cash-in and cash-out transactions, but they are not located in the research areas.

2. PT. Indosat Oredoo

The company is the second largest mobile network operator with around 70 million subscriber nationwide. They offer mobile money products (Dompetku) and have launched the Dompetku Nusantara product in partnership with regional development banks, multi-finance institutions, and insurance and investment companies. Unfortunately, Dompetku merchants are not yet present in Bengkulu.

3. PT. XL Axiata

The third largest telecommunications provider with around 52 million subscribers, XL has strong connections in the eastern part of Indonesian, namely Bali, Lombok and NTB. They also have a mobile money product called XL Tunai with around 200 thousand active users. The company is focusing and targeting 4G users to expand their number of subscribers. XL is the only MNO that has developed an application for farmers and fisheries. In May 2013, XL launched XL Bumiku[5] for farmers, which helps farmers anticipate weather changes. Through XL Bumiku, farmers receive weather forecast in the initial stage and later receive land and crop tips, price information, and purchase harvest. In August 2015, XL launched mFISH[6], an android-based application for fisheries, which helps fishermen with information on wind speed and direction, wave height, the weather information, the location of plankton, and the price of fish. As with the Dompetku merchants, XL Tunai merchants are also not present in Bengkulu

4. PT.8villages Indonesia

In December 2012, with support from Mercy Corps, PT.8villages launched LISA (Layanan Informasi Desa/Village Information Service). By registering on a LISA platform, smallholder farmers can receive daily tips on good agriculture practices; send questions to experts and access weather and market price information. Currently there are more than 100,000 smallholder farmers registered on the LISA platform. In addition to the LISA platform, PT.8villages Indonesia in partnership with the Agriculture Faculty, Gadjah Mada University, PT. XL Axiata and Mercy Corps launched PETANI (Farmer) an android-based application in November 2014. Data showed that there are 6 PETANI application users in Bengkulu, most of whom are horticulture farmers.

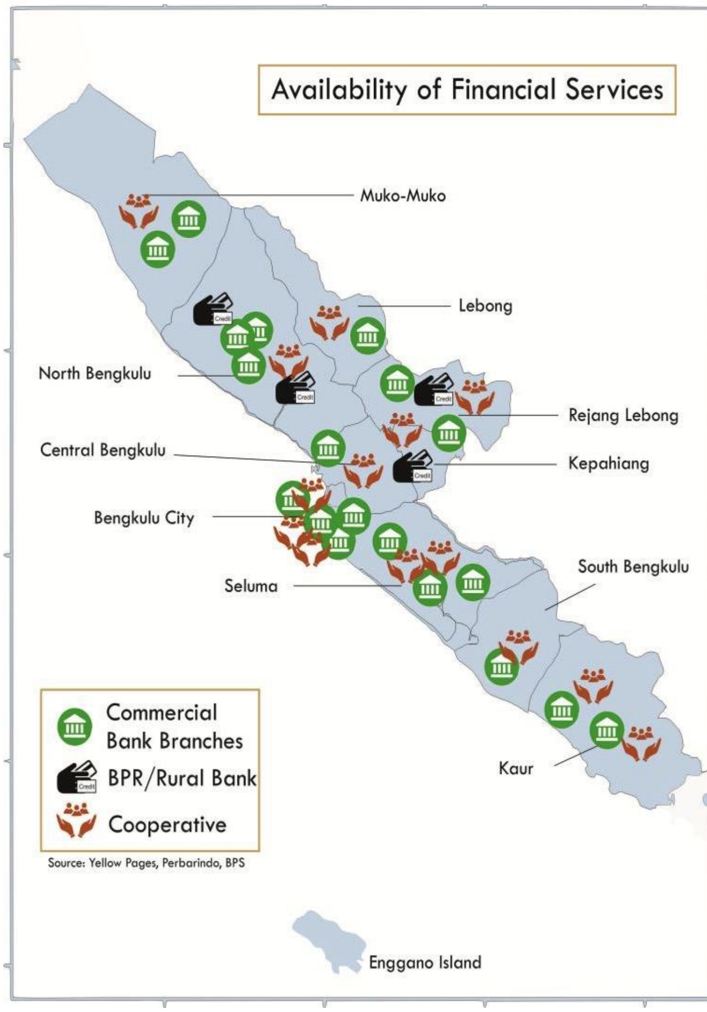
5. Branchless banking for financial inclusion (LAKU PANDAI)

The Financial Service Authority (OJK) launched the LAKU PANDAI regulation in November 2014 to improve access for unbanked people to formal financial institutions. There are seven commercial banks approved by OJK to implement LAKU PANDAI and as of December 2015, there are more than

[5] Supported by Toto Agriculture, a non-profit organization funded by Bill and Melinda Gates Foundation
[6] In partnership with the National Weather Agency and Ministry of Marine Affairs and Fishery

60,000 bank agents providing financial services to approximately 1,2 million customers. 76% of the agents are located in Java, 12% in Sumatera and the remaining 12% spread across Eastern Indonesia.

Figure 11. Availability of Financial Services



The research indicated that the BRI Unit Sukaraja (30 minute drive south from Bengkulu city) has **six BRILink (agents) located in villages such as Sukasari, Keban Agung, Talang Sebaris, Sumber Arum, Sari Mulyo and Gunung Agung**. Those six agents have been provided with Electronic Data Capture (EDC) by BRI for banking transactions.

6. Rural Banks (Bank Perkreditan Rakyat/BPR)

There are four BPRs operating in Bengkulu. The closest BPR to the research area is **BPR Dian Binarta** (private owned) **located in Arga Makmur, North Bengkulu** but it does not have customer profiles of coconut sugar producers.

7. Cooperatives

Bengkulu Province has more than 160 registered cooperatives but only 50 active cooperatives spread almost equally across the region. One of the active cooperatives is located in **Tais** (capital of Seluma municipality) named Saving and Loan Cooperative**/Koperasi Simpan Pinjam Muda Karya Seluma,** which is catering mostly to civil servants for consumer loans with their vehicles or government employee decree as collaterals.

I. Gap Analysis in Providing Mobile Information and Financial Services

1. Demand for Mobile Information

From the above information obtained from the surveys and in-depth interviews with value chain actors, the following gaps can be highlighted:

- Coconut sugar producers use mobile phones mainly for texting and making calls. The majority only has basic phones.
- The willingness to pay may be low for mobile solutions but the demand for access to information, especially on market prices for coconut sugar as well as advice on how to improve the quality of coconut sugar is very high.

2. Demand for Financial Services

- Coconut sugar producers lack access to formal financial services for several reasons, namely collateral requirements, complex procedures, and distance to the closest formal financial institution. However, despite the lack of access to formal financial services, coconut sugar producers are finding ways to meet their savings and loan needs through informal channels.
- Producers need adequate information on existing formal financial products that can meet their needs, particularly loan products.

J. Recommendations

1. The penetration of mobile phone usage among coconut sugar producers is fairly high (57%) and there is potential for mobile solutions to be developed and introduced in order to cater to the coconut sugar producer's needs.
2. Coconut sugar producers are also showing high interest in training (95%), especially on how to improve the productivity of coconut trees and how to increase the quality of their product. There is potential for face-to-face interactions through group meetings or for mobile application services, like SMS blasts, web-based, and content applications, which can deliver technical advice on good agricultural practices as well as information on price, weather, input suppliers, offtakers, etc.,
3. Create demand for mobile usage and develop awareness raising strategies to convince the coconut sugar producers of the benefits of accessing such information and other services through mobile phones that could lead to cost and time savings.

4. Empower and legitimize the existing informal coconut sugar producer groups to become stronger groups and potentially grow into formal cooperatives. These groups can serve as agents to introduce the aforementioned initiative, and as centers for learning to introduce technology-based products, which require experiential learning from the users. Such groups may eventually also take on the role of mobile banking agents to serve coconut sugar producers in particular.

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Annex 1.
In-Depth Interview List of VALUE CHAIN ACTORS and SUPPORT

Description	No	Name	Institution/Role	Mobile #	Location
Value Chain Actor					
Collector	1	Samijah	Collector	0853 7844 3776	Pal 30, Lais
	2	Suroso	Collector	0823 7796 7886	Pal 30, Lais
	3	Sumadi	Collector	0821 8515 8844	Pal 30, Lais
	4	Sulemi	Collector	0852 6835 8399	Sumber Rejo, Hulu Palik
	5	Kasih	Collector	0853 7863 6587	Lokasi Baru, Air Periukan
	6	Sukirno	Collector	0813 7357 2483	Penago Dua, Ilir Talo
	7	Suyatmi	Collector	0821 8285 0043	Penago Dua, Ilir Talo
Support					
University	8	Prof.Ir.Priono Prawito Dr.M.Sc	Soil Department, Forestry Faculty - Bengkulu University	0822 817 33358	Bengkulu city
Government	9	Jamiati	District Office for Industrial, Trade, Cooperative and SME	0812 7185 1365	Bengkulu city
	10	Agusman Latif	Sub-district Office for Industrial, Trade, Cooperative and SME	0812 7804 6448	Bintuan, Kaur
	11	Ali Usman	Extension Officer - Disperindagkop	0813 6801 1339	Agra Makmur, North Bengkulu
	12	M.Saleh	Head of Agency for Plantation Crop Protection	0852 8983 2665	Bengkulu city
Certification Body	13	Siti Mardayanti	Agency for Testing and Certification of Goods (Balai Pembinaan & Pengawasan Mutu Barang/ BPPMB)	(0736) 20189	Bengkulu city
Industry/ Company	14	David	Indosat	0815 8660 6382	Jakarta
	15	Anita Hesti	8villages Indonesia	0816 1684 150	Jakarta

Annex 2.
List on Additional In-Depth Interview of VALUE CHAIN ACTORS and PRODUCERS

Description	Name	Institution/Role	Mobile #	Location
Collector	Kasih	Collector	085378636587	Lokasi Baru, Air Periukan, Seluma
	Khoirah	Collector		Purbosari, Seluma Barat, Seluma
	Sukirno	Collector/Producer	082306815992	Penago Dua, Ilir Talo, Seluma
	Parwati	Collector		Penago Dua, Ilir Talo, Seluma
	Sarmi	Collector/Producer	085273317063	Mekarsari, Ilir Talo, Seluma
	Rukiah	Collector		Pal 30, Lais, North Bengkulu
Community Leader	Darto	Head of Community	085658826619	Lokasi Baru, Air Periukan, Seluma
	Tri	Head of Village	085269867378	Purbosari, Seluma Barat, Seluma
	Disnoto	Government Official	081367474801	Penago Dua, Ilir Talo, Seluma
	Qori	Former Producer	082184002973	Pal 30, Lais, North Bengkulu
	Tudjo	Head of Village	085378443776	Pal 30, Lais, North Bengkulu
	Mukshin	Former Producer		Pal 30, Lais, North Bengkulu
Producer	Hardiah	Senior Producer		Lokasi Baru, Air Periukan, Seluma
	Novriadi	Senior Producer		Mekarsari, Ilir Talo, Seluma
	Siswanto	Senior Producer		Mekarsari, Ilir Talo, Seluma
	Supangat	Senior Producer	085369499263	Purbosari, Seluma Barat, Seluma
	Anton	Junior Producer	082226215033	Penago Dua, Ilir Talo, Seluma
	Kisnen	Junior Producer		Mekarsari, Ilir Talo, Seluma
	Panggeh	Junior Producer		Purbosari, Seluma Barat, Seluma
	Sutirah	Senior Producer		Pal 30, Lais, North Bengkulu
	Lilis	Junior Producer	082372457191	Pal 30, Lais, North Bengkulu
Young Generation (not produce coconut sugar)	Anggoro	Unemployed		Lokasi Baru, Air Periukan, Seluma
	Agus	Rubber Labor		Penago Dua, Ilir Talo, Seluma
	Kasirun	Lumberjack Labor		Mekarsari, Ilir Talo, Seluma
Bank/Cooperative	BPR Dian Binarta	Rural bank		Jl. Prof M Yamin No. 322, Arga Makmur
	BRI Unit Sukaraja	Bank Branch (distric)	(0736)7311691	Jl. Raya Manna No. 41, Sukaraja
	KSP Muda Karya Seluma	Cooperative	082184150513	Jl. Umar Akhmad RW3, Pasar Tais
	BRI Unit Lais	Bank Branch (district)		Lais, North Bengkulu
Convenient Stores in Kota Bengkulu	Happy Mart	Convenient Store		Jl. Kapuas Raya
	Indomart	Convenient Store		Jl. Kalimantan, Rawa Makmur
	Indomart	Convenient Store		Jl. Kapt. Tendean, Gadiang Cempaka
Telco Provider Outlets	Grapari Telkomsel	Telco Outlet		Jl. P. Natadirja, Kota Bengkulu
	Gerai Indosat	Telco Outlet		Jl. S. Parman, Kota Bengkulu
	Xl Centre	Telco Outlet		Jl. Jenderal Sudirman, Kota Bengkulu