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DEVELOPMENT STRATEGY FOR SUGAR PALM PRODUCTION IN EAST KALIMANTAN

This study aims to determine the potential production of sugar palm in Loa Duri Ulu village, Kutai Kartanegata regency and to explore its development prospects and industrial management potential. The research uses participatory rural appraisal approach and SWOT-analysis in designing the process and empowering the optimization of society's participation. The suggested strategies are focused on potential partnership of business groups and building a cooperative link.

Keywords: *sugar palm; SWOT-analysis; focus group discussion; strategy development; cooperation of farmers.*

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СТРАТЕГІЯ РОЗВИТКУ ВИРОБНИЦТВА ПАЛЬМОВОГО ЦУКРУ У СХІДНОМУ КАЛІМАНТАНІ

У статті зроблено спробу визначити виробничий потенціал цукрового виробництва на прикладі поселення Лоа Дурі Улу, регіон Кутаї Картанегата. Досліджено перспективи розвитку та потенціал становлення промислового виробництва пальмового цукру. У дослідженні використано метод оцінювання ситуації із залученням безпосередньо фермерів, а також SWOT-аналіз для побудови процесу оптимізації залученості місцевої спільноти в розвиток бізнесу. Запропоновані стратегії розвитку роблять акцент на потенційному партнерсті місцевих бізнес-груп та формуванні осередку взаємодії.

Ключові слова: *цукрова пальма; SWOT-аналіз; дискусії у фокус-групах; розвиток стратегії; співробітництво фермерів.*

Рис. 2. Табл. 4. Літ. 30.

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СТРАТЕГИЯ РАЗВИТИЯ ПРОИЗВОДСТВА ПАЛЬМОВОГО САХАРА В ВОСТОЧНОМ КАЛИМАНТАНЕ

В статье сделана попытка определить производственный потенциал сахарного производства на примере посёлка Лоа Дури Улу, регион Кутаи Картанегата. Исследованы перспективы развития и потенциал становления промышленного производства пальмого сахара. В исследовании использован метод оценки ситуации с участием самих фермеров, а также SWOT-анализ для выстраивания процесса оптимизации вовлечённости местного общества в развитие бизнеса. Предложенные стратегии развития делают акцент на потенциальном партнёрстве местных бизнес-групп и формировании ячейки взаимодействия.

Ключевые слова: *сахарная пальма; SWOT-анализ; дискуссии в фокус-группах; развитие стратегии; сотрудничество фермеров.*

Introduction. Most of the villagers who live by the forest are destitute society since the majority of these people are farmers and laborers. The forest supply most of their daily necessities (Hasan, 2010). Land occupation has its social and economic impact on those people. The situation is affected by high demand for cultivated land. Referring to the occupancy of lands, deforestation is often performed with an excuse of cultivation for agriculture and plantation.

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High agricultural activities rate is often caused by the ignorance concerning how these activities could damage the forests. Moreover, it is often done without permission from the authorities. It is particularly so when areas are part of national parks as in Bukit Suharto, which is also part of conservation area. The related regulation was signed by the Circular Governor of East Kalimantan, No. 521/1875/Ek as of March 2, 2009.

The results of the study on the community around the conservation area show that this community tends to be blamed as perpetrators of forest defacement. Meanwhile, the government had not been adequate to provide other, alternative solutions for their economic troubles beside staking benefit from the forest (Sunanto, 2008; Situmeang, 2010).

The government policy in prohibiting the community to have chance to maintain the functions of the forest is inappropriate. It is the time for them to get involved in the forest management collaboratively.

Smart utilization of the resources is still possible by having clarity concerning its preservation (HHBK). For examples, agro-forestry – planting the forest area with rubber crops, fruit plants, palmae and herbals. One of palmae that has the big potential in this regard is sugar palm crop.

The potential of sugar palm could be viewed in two aspects, they balance the ecosystem and improve rural ecology.

Special function of sugar palm tree is that it preserves natural resources, soil especially. Fiber root of sugar palm tree is very firm, deep, and crept bound by the ground so it is important in fighting erosion. In addition to this function, sugar palm root has also absorbent water capacity, so it can be grown in the relative dry areas and does not need intensive maintenance. It also helps conservation of the environment, especially under reforestation in the sloping areas of mountains and rivers. Economically, sugar palm tree is be able to support the income of a community, if they are entrepreneurs selling palm juice and brown sugar palm. Unfermented sugar palm could produce beverage (palm-sap) and palm sugar (kawung). Palm juice from the sugar palm tree could produce ethanol (ethyl alcohol), which serves as alternative fuel to replace kerosene, liquid petroleum, and gasoline.

The areas that we study as the conservation area located in 5 villages from two subdistricts of Kutai Kartanegara Regency, close to the conservation area of Loa Haur village. One of them is Loa Duri Ulu village, which has the highest potential for sugar palm planting and its industrial processing.

Formulation of the research problems is as follows:

1. What is the potential for production of sugar palm in Loa Duri Ulu village?
2. What can be the development strategies for industrial processing of sugar palm in Loa Duri Ulu village?

The aims of the research are: 1) to reveal the production potential of sugar palm in East Kalimantan; 2) to build the prospective development strategies for industrial processing of sugar palm in East Kalimantan.

Research methodology. This research is a descriptive one, the approach applied was participatory rural appraisal in the process of planning and centralization design which was also the basis to actualize the generating and maximizing participation of the community. We also include the investigation of rural history, making the trend

chart of changes, making the season calendar, developing the map of the village, investigating location, studying the organization of the village, studying villagers' livelihoods, interviewing farmers' families (via semi-structured interviews).

For assessment of the conditions we used SWOT. Data and information collected were classified into internal and external. Internal conditions depict the strengths and weakness, whereas external conditions show opportunities and threats.

Afterwards, data and information were compiled inside matrix factors of the internal strategy factor (Internal Strategy Factors Summary – IFAS) and matrix factors of the external strategy in the External Strategy Factors Summary (EFAS).

Results and discussion.

General information about sugar palm planting in East Kutai Kertanegara regency. Dissemination of sugar palm planting in East Kalimantan covers almost all districts with the total of scope was 1.253 ha and total of palm sugar production being 971 tons which 1,815 workers employed (Agricultural Department of East Kalimantan Province, 2011)

Kutai Kartanegara is the second largest palm oil plant producer in East Kalimantan. Producers spread between 6 subdistricts from 18 subdistricts – Loa Kulu, Loa Janan, Sebulu, Muara Kaman, Kota Bangun and Kenohan, with the range of crops 363 ha consisted of 125 ha TBM, 222 ha TM, and 16 ha TT/TR. The largest production falls on Loa Kulu and Loa Janan. Wide range of sugar palm planting in Loa Kulu in 2011 was 146 ha with the production of 42 ton, or 32.06%, from the total production of Kutai Kartanegara regency (131 ton). While the wide area of sugar palm planting in Loa Janan in 2011 was 132 ha with the production 72 ton, or 54.96% of the total production of Kutai Kartanegara regency.

The number of employees at sugar palm plantations were 519 workers. The area of sugar plantations in Kutai Kartanegara was wider compared with East Kutai, the production however was lower due to variety of sugar palm seeds applied in both regencies (Mariati, 2013).

The effort to develop and maintain sugar palm planting. Loa Duri Ulu village is located to the West from the capital of Kutai Kartanegara regency, Tenggarong town (28 km) or 18 km from the Eastern side capital of East Kalimantan province. The village territory reaches 12.550 ha divided into 5 villages or 18 neighborhood associations. In 2012 the total of inhabitants was 8,628 people, or 5,405 households.

The results of data collection gathered through in-depth interviews and group discussions with the villagers and sugar palm farmers followed by field observations helped us get information on sugar palm planting in this village. This information shows that the most of farmers were residing in RT 10 (Gintung Village), RT 11 (Putat Bugis Village), (Karya Baru Village) and RT 12 (Musaping Village). The number of farmers engaged in sugar palm planting in these 4 villages were 27 workers (or 0.5% from the total of householders).

In general, the average farmers' age was between 45–55 years. This reflects that sugar palm is often an inherited business, mostly in the second generation. Most of these farmers used to be immigrants who came from different ethnics groups, such as Bugisnese and Javanese who had diffused and settled in these villages permanently. The farmers considered planting sugar palm as the main activity over other field activities. It contributes the most to their family income. Most of sugar palm production

contributes through as: a) consumption; b) manufacturing fermented palm wine; c) raw materials for manufacturing palm sugar (molded brown palm-sugar), then sold to the market.

Prior to our research farming management was rather traditional, that is by squeezing or tapping palm juice from the trees. Generally, management of sugar palm included: a) selection of sugar palm buds that would be projective plants, b) their maintenance; c) preparations for sugar palm cropping; d) tapping process itself. The standing condition of sugar palm farming in Loa Duri Ulu village could be seen in the following Table 1.

Table 1. **Sugar palm production in Loa Duri Ulu village,** *focus group discussion*

The analysis	Data on each village		
	Gintung	Putat bugis	Musaping
The number of sugar palm farmers	13 householder	9 householder	5 householder
Ethnical majority	Banjarnese, Bugisnese and Javanese	Bugisnese	Bugisnese
The green sugar palm plants	1000 trees	3000 trees	1000 trees
The green sugar palm in production	100–200 trees/farmers	300–500 trees/farmers	50–100 trees/farmers
The sugar palm actually produced	50 trees /farmers	5–10 trees/farmers	2–10 trees/farmers

Further process production (molded brown palm-sugar) is a traditional home industry employing only a few workers, whereas other products of sugar palm plant do not bring more profit so it is just for their own needs. Dependence of farmers on this plant is only due to molded brown palm sugar and granulated sugar or fermented palm wine supporting their income. On the other hand additional activities can be making brooms from sugar palm fibers and leaf rib but generally it is still less supported (Tenda et al., 2011).

Therefore, production of palm sugar is most important in supporting local farmers. Table 2 presents information on palm juice and processing of palm juice to be sugar which conducted by sugar palm farmers in Loa Duri Ulu village.

The results of palm juice production in this village show quite a variation, so we display both lowest and highest results. According to the farmers, this difference occurs due to several reasons: 1) sugar palm farmers have many other routines; 2) there are two types of palmaes which are suspected to effect the production volume of sugar palm juice and the level of sugar content; 3) the different of expertise or habit in tapping the sugar palm; 4) the results of the tapping of sugar palm juice during dry season decreased more compared with rain season. However, the level content of sugar was higher during dry season. It influenced the calculation liter of sugar palm juice that was equal with palm sugar after being processed. Based on the primary data that gathered from PRE, the analysis was continued to determine issue that had been received from the community.

Developing a strategy for sugar palm planting. Before developing a strategy internal factors received from the interviews and results of the first questionnaire were ne-

cessary as identified factors that influenced the success of this industry in Loa Duri Ulu, Kutai Kartanegara regency.

Table 2. **Palm juice in sugar palm farming, Loa Duri Ulu village,** *focus group discussion farmers* in Loa Duri Ulu Village (2014)

Analysis	Lowest results	Highest results
Results for palm juice:		
1 trunk of sugar palm	5 liters/day	15 liters/day
The average of tapped days/year	6 months x 25 days = 150 tapping days/year	
Results as of palm juice/trunk/year	5 liters/day x 150 days = 750 liters/tree/year	15 liters/day x 150 days = 2,250 liters/tree/year
Sugar result:		
The average content (after cooked)	1 liter of palm juice = 0.3 kg of brown palm sugar	
Production of sugar after being cooked	750 liters = 225 kg sugar	2.250 liters = 675 kg sugar
Profit from sugar palm/year (the price of sugar palm = 20,000 Rp./kg	20,000 Rp. x 225 kg = 4,500,000 Rp.	20,000 Rp. x 675 kg = 13,500,000 Rp.
The average of sugar palm production/month	4,500,000 Rp. / 12 months = 375,000 Rp.	13,500,000 Rp. / 12 months = 1,125,000 Rp.
If sugar palm juice is sold directly:		
Production of sugar palm juice/year (the price of liquid sugar palm juice = 2,000 Rp./kg)	750 liters x 2,000 Rp. = 1,500,000 Rp.	2.250 liters x 2,000 Rp. = 4,500,000 Rp.
The average income of sugar palm juice/month	1,500,000 Rp. / 12 months = 125,000 Rp.	4,500,000 Rp. / 12 months = 375,000 Rp.

Basing on the IFE matrix (Internal Factor Evaluation) we received a number of strong scores = 2.27 and the number of weak scores = 0.6. From the results gained weight scores: 2.27 + 0.61 = 2.88. High profit received by sugar palm entrepreneurs and availability of raw materials from nature which did not require the maintaining costs turn out to be the main strengths (0.60 and 0.80 scores accordingly).

From the evaluation of internal factors and external factors, the total IFE (Internal Factor Evaluation) = 2.88 and the total EFE (External Factor Evaluation) = 2.97. More details could be seen in Table 4.

The home industry condition of palm sugar can be classified be cell V (Hold and Maintain). Combination of both values shows that the main strategy for development is in cell V. Cell V belongs to group strategy of growth through horizontal integration. It means business expansion via constructing in other locations and increasing variety of products as well as services.

The growth strategy is the growth of business. It is designed to achieve the development of sales, assets, profit or the combination of the three of them.

Matrix of SWOT-analysis. Quantitative Strategic Planning matrix (QSP) was used to determine which strategy would be the best one (David, 2004). The strategy chosen was based on the results of the analysis calculation.

Results of the QSP presented the highest weight with the total score of 6.84. It is not surprising that reduction of human resources, conversion of plantation lands to be mining lands and lock of cooperation among farmers caused many difficulties with progress.

Table 3. **Identification of problems, main factors and effects of sugar palm farming,** *authors' focus group discussion* Loa Duri Ulu Village (2014)

Problems	Factors	Effects
Inconsistent policy of the government in the food sector	1. Less government attention to palm sugar production. 2. The government is not serious about improving farmers' welfare. 3. Increasing transition of lands under mining by giving licenses or permissions on mining fields.	1. Local production of palm sugar is less known and seems unattractive to bakery industry. 2. Forest areas suitable for plantation had been converted due to controlled mining. 3. Palm sugar is often regarded as the supplementary artificial sweetener.
Limitations of palm sugar markets and insufficient production	1. Less government attention to palm sugar production. 2. The government is not serious about improving farmers' welfare. 3. Lack of diversification in sugar palm production.	1. Farmers are not interested to have large production volumes. 2. Farmers tended to sell product as palm wine. 3. Low income of farmers. 4. Many farmers lost their motivation to be more productive.
Processing palm juice by locals is still very traditional	1. Lack of farmers' capital and there is no support for it. 2. No support for equipment and technology use from the government or the agriculture department.	1. Limitations in palm sugar production. 2. High risks of potential accidents at the time of tapping. 3. Quality of palm sugar product is not standardized. 4. Low income of farmers.
Uncertain demand from the market	1. Price for this product are not constant. 2. The order for palm sugar decreases out of the Ramadhan.	1. Low income of farmers. 2. The farmers are not interested to have large production quantities
There were only few government/ private investments to support this business	1. No support from government to monitor the growth of this business. 2. Low market value of palm sugar. 3. No available accurate data on the potential of palm sugar. 4. Small market for sugar palm products.	1. The potential forest with large sugar palm plants became unproductive. 2. The situation with social economy progress was hindered. 3. Slowing down growth of economics in the village.
No institutional support for palm sugar farmers	1. Lack of farmers capital and no support. 2. No inter-group cooperation.	1. Farmers still work individually. 2. No marketing co-operation. 3. No standardization in determination of market value. 4. Weakness of market information. 5. Limitations in the range of the markets.
This location is difficult to reach	1. It has similarity with primeval forest.	1. It is difficult to carry out surveys here. 2. Exploitation and investments face many barriers.

So the appropriate option for sugar palm farmers is the stabilization strategy by establishing inter-group cooperation of the community to increase their incomes. It would be especially appropriate in dealing with huge orders, where now inactive

groups could cooperate to cover the orders. In this case, each individual would get same opportunities for earning.

Table 4. **Matrix of internal and external factors,** *calculated based on* (David, 2004)

Internal / External	Strength (3.0–4.0)	Average/Mean (2.0–2.9)	Weaknesses (1.0–1.9)
High (3.0–4.0)	*I (Grow and Build)*	*II (Grow and Build)*	*III (Hold and Maintain)*
Moderate (2.0–2.9)	*IV (Grow and Build)*	***V (Hold and Maintain)***	*VI (Harvest and Divestiture)*
Low (1.0–1.9)	*VII (Grow and Build)*	*VIII (Harvest and Divestiture)*	*IX (Harvest and Divestiture)*

		STRENGTHS	**WEAKNESSES**
INTERNAL / EXTERNAL		a) availability of the local hybrid seeds; b) high potential of production; c) good quality of product; d) availability of raw material (always available, any seasons); e) high profit; f) availability of the raw material from the nature, no maintaining costs; g) facilities and basic infrastructure are easy to get.	a) processing technology, packaging and marketing are still rather traditional; b) limited sources market value information; c) no diversification of product, only granulated sugar; d) lack of own capital of the farmers and no financial support; e) no institutional provision the palm sugar farmers; f) no support from the plantation department in provision of hybrid seed and new cultivation techniques.
OPPORTUNITIES	a) the order at this market had never decreased; b) sugar palm product had high market value; c) partnership/ cooperation with food companies; d) growing population; e) the policy of the regional government concerning the development of sugar palm planting as preserving the forest.	**STRATEGY S–O Focusing on Growth** 1. Expanding the cultivation of sugar palmae. 2. Diversification of palm sugar product. 3. Mapping the development area for production of sugar palm (Mariati, 2013).	**STRATEGY W–O Minimizing, Weaknesses by Using Opportunities** 1. Formatting the entrepreneur cooperation inside sugar palm community to develop their businesses further. 2. Technical skills development to increase the quality of products. 3. Training in business management.
THREATS	a) reduction in the number human resources involved in sugar palm business; b) these is a number of substitution products from sugar palm from outside areas with cheaper prices; c) transition of the land function to become coal mining areas.	**STRATEGY S–T Using strengths by avoiding threat** 1. Developing the partnership with stake holder. 2. Maximizing the available production capacity.	**STRATEGY W–T Overcoming losses (by minimizing weaknesses and avoiding threats)** 1. Better to capital access. 2. Expanding and maintaining the marketing network. 3. Determining more exact price and operational costs.

Figure 1. **SWOT-analysis,** *authors'*

Many other obstacles faced by sugar palm farmers could be also overcome. Many problems are determined by the quality of human resources dealing with the problems. The HR aspect is very important because the to key success is human resources management and the behavior of the people managing various aspects of it (Purnomo, 2010).

Related to the sugar palm farmers' necessities and management, trainings would be necessary in terms of marketing, organizational management, production, finance and technical skills to increase the quality of the product.

Based on the strategy that was compiled according to the SWOT-matrix above, the development model for sugar palm production in East Kalimantan seems to be quadrant turn-around and defensive. Therefore, the development model needed to be applied lies within the pattern of partnership as illustrated in Figure 1.

The model of an agro-polis can be applied in the management of plantation, fishery and husbandry in the area. Sugar palm is thus categorized as the agricultural/plantation product. Figure 2 presents the model of centered agro-polis which serves in strengthen the efforts to support villagers' economics.

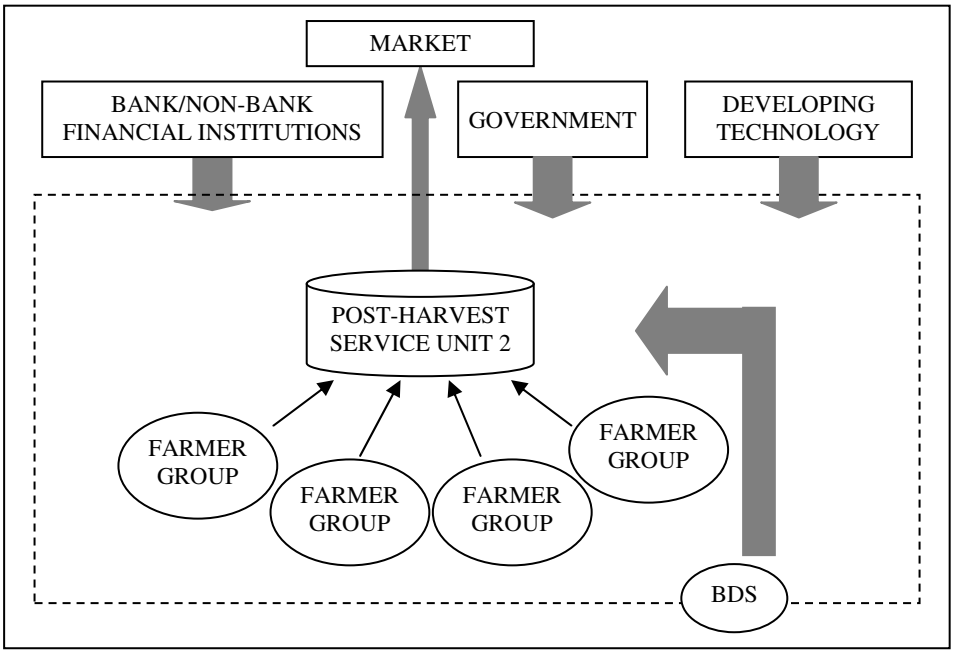

Figure 2. **Agro-polis strengthening the efforts to support social economy by utilizing sugar palm,** *modified after* (Sulaeman, 2006)

Conclusions. Based on the results of the research and discussions, it could be concluded that:

1. Development of sugar palm production in Loa Duri Ulu village, Kutai Kartanegara regency could be intensified.

2. Processing management of sugar palm production in Loa Duri Ulu village is still traditional, directed primarily at molded brown palm sugar, whereas producing of

sugar palm juice to become granulated sugar is not the optimal variant in terms of quality.

3. Based on SWOT-analysis, the development strategy for sugar palm production in East Kalimantan is in quadrant "turn around and defensive". Development model to be applied is thus partnership by establishing co-entrepreneur group.

4. Based on calculated matrix Quantitative Strategic Planning (QSP), the best option for sugar palm farmers is the stabilization strategy by establishing an entrepreneur group inside the sugar palm community to develop their business further.

Suggestions. The Government must pay more attention to palm sugar business in Loa Duri Ulu village with various management programs in mind. Developing the quality of sugar palm production is also important. One of such programs much be aimed at facilitating the establishment of cooperation. It could be implemented inside the entrepreneur group by providing production better access, for example, to funding, technical industry, trainings on productivity and business management. Next steps would be maximizing cooperation in autonomy, institutional provision and other forms of support.

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