Commodity Status report: Gemor

March, 2010

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This report was prepared for
The Kalimantan Forests and Climate Partnership

Australia Indonesia Partnership
Kemitraan Australia Indonesia

This report was prepared in accordance with the guidelines at the time of writing, including the overview of the KFCP project below. This research was carried out in collaboration with the Governments of Australia and Indonesia, but the analysis and findings in this paper represent the views of the author/s and do not necessarily represent the views of those Governments.

Australia's International Forest Carbon Initiative is a key part of Australia's international leadership on reducing emissions from deforestation. The Initiative will support international efforts to reduce deforestation through the United Nations Framework Convention on Climate Change (UNFCCC). It aims to demonstrate that reducing emissions from deforestation and forest degradation can be part of an equitable and effective international agreement on climate change. A central element of this is the Initiative's focus on developing practical demonstration activities in our region, particularly in Indonesia and Papua New Guinea.

Indonesia and Australia are working together under the Indonesia- Australia Forest carbon Partnership (The Partnership) to support international efforts on REDD through the UNFCCC. A key focus is on practical demonstration activities to show how REDD can be included in a future global outcome on climate change. Activities under the partnership are funded through Australia's $200 million International Forest carbon Initiative (IFCI) administered by the Australian Department of Climate Change (DCC) and AusAID.

Australia has committed $30 million over four years to the Kalimantan Forests and Climate partnership (KFCP). Under the KFCP, Australia and Indonesia are working together to develop and implement a large scale REDD demonstration activity in Central Kalimantan. The KFCP is the first REDD demonstration activity of its kind in Indonesia. It aims to demonstrate a credible, equitable and effective approach to reducing emissions from deforestation and forest degradation, including from the degradation of peatlands, than can inform a future global outcome on climate change. With an overall funding target of $100 million, the KFCP aims to raise remaining funding through contributions from or coordinated actions with the private sector or other donor countries.

This report was prepared by the GRM Livelihood Team comprised of Johan Kieft and Teddy Kristedi under the management of GRM International. Additional support was provided by Suhada and Ben Tular of CARE Indonesian International. The study was developed and managed by Grahame Applegate, with support from Tim Jessup, both of KFCP. Administrative Assistance was provided by Pak Eko Pranandhita of the KFCP in Palangkaraya. The work was financed by the Indonesia-Australia Forest Carbon Partnership, managed by Neil Scotland from the IAFCP Partnership Office.

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1. Introduction

Gemor (*Alseodaphne sp*.) is a Non-Timber Forest Product (NTFP) plant species found on peat forests growing under swampy conditions. Gemor tree bark contains 1.80% Pyrethrin (Zulnely and Martono, 2003) and is commonly used for the production of mosquito coils. Pyrethrins are also used in many varieties of insecticides, fogging products and in some pet products.

Preliminary work prepared by the KFCP project suggests that Gemor is a commodity that may be developed as an alternative livelihood for communities in the project area. This report provides data on the demand and supply side of the commodity discusses the importance of the commodity for peat land sustainability and local community livelihood.

Gemor-related information has been collected by various project components (e.g. CARE, GRM and ICRAF documents). Where relevant, data from these documents are cited in this report. The report was written based on a literature study of these documents and additional information from meetings and interviews conducted at the end of February 2010 and a follow up visit held in mid-March[1]. This report provides an up-to-date market perspective of Gemor.

The report is organized as follows. The first section provides a background on the importance of gemor for the local community and peat land ecology. The second section describes aspects of gemor production and the supply side of the commodity. The third section describes the market chain beyond the farm gate and the demand side of the commodity, with a particular reference to project sites. Fourth section provides conclusions.

2. Background

2.1. The importance of gemor to Local livelihood

As stated in the CARE Baseline report, Livelihoods in the KFCP area are primarily based on agriculture and the extraction of forest resources. In Block A, due in large part to the improved access and clearing of forests from the Ex-Mega Rice Project, the pattern of livelihoods include both upland agriculture and forest extraction. In Block E, where there is almost no land clearing in peat areas and limited access to forest areas, livelihoods are still based on forest extraction.

Gemor is a key source of livelihoods for communities residing in the KFCP project area, particularly in Block E. According to the KCFCP baseline study, 14 percent of the households in block E claim that gemor is their main source of income and another 7 percent claims gemor as their secondary source of income. The figures for block A are lower, with 4 percent and 5 percent respectively. Table 1 summarizes some important figures related to gemor in both blocks. Table 2 provides the position of gemor compared to other source of income.

[1] Field trip : 10 -15 February 2010 (GRM and CARE) and 11 march 2009 (CARE with guidance provided by GRM)

Table 1. Key gemor related indicators.

Key Indicators	Block A	Block E
Income/livelihoods		
Gemor as primary income	4%	14%
Gemor as secondary income	5%	7%
Gemor as primary or secondary income	9%	21%
Use of forest product		
Gemor wood exploited	1%	0%
Gemort bark exploited	19%	36%

Source: CARE baseline report, 2009

Table 2. Sources of income in Block A and Block E in 2008

Sources of Income	Income per Household				Income per Capita	
	Block A		Block E		Block A	Block E
	Rupiah	%	Rupiah	%	Rupiah	Rupiah
1. Agriculture						
Swidden-rice cultivation	1,447,083	9.0	73,500	0.4	364,811	16,705
Rubber plantation	5,023,573	31.1	899,680	4.3	1,266,447	204,473
Rattan plantation	162,167	1.0	11,000	0.1	40,882	2,500
2. Forest Extraction						
Timber	1,071,333	6.6	1,081,667	5.2	270,084	245,833
Gemor	215,200	1.3	7,413,167	35.3	54,252	1,684,811
Rattan	70,500	0.4	704,000	3.4	17,773	160,000
3. Fishing	2,737,967	17.0	8,173,533	39.0	690,244	1,857,621
4. Worker (laborer)						
Gold mining	120,000	0.7	1,363,633	6.5	30,252	309,917
Sawmill	238,000	1.5	-	0.0	60,000	0
Other	717,000	4.4	423,333	2.0	180,756	96,212
5. Firewood	238,000	1.5	242,667	1.2	60,000	55,152
6. Entrepreneurship	2,031,333	12.6	388,333	1.9	512,101	88,258
7. Professional	1,781,333	11.0	-	0.0	449,076	0
8. Other	294,133	1.8	207,950	1.0	74,151	47,261
9. Total Income Per Year	16,147,623	100	20,982,463	100	4,070,829	4,768,742
10. Income per day					11,153	13,065

Source: Suyanto *et. al.*, 2009.

Gemor is not new to local livelihoods. The local community has been extracting gemor from their forests since the 1970's (Suyanto et. al., 2009). Our interviews with traders and collectors also suggest that gemor extraction started in 1970's with Fumakilla and Baygon being the first pioneers in the sector. Fumakilla and Baygon are multi-national java-based mosquito coil producers, and basically the ones who defined the local market and educated local suppliers on their preferred standards for gemor. The local market is tight nit, and most of our interviewees have more than 10 years experience in the sector and claim to know everybody in the business. Table 3 summaries the importance of gemor related to other forest product during the period of 1970 to 2008.

Table 3. Main forest products used by the residents in the villages in Blocks A and E in 1970 – 2008 (sorted by ranking of importance)

Prior 1970	Before Mega Rice Project (1970-1995)	After Mega Rice Project (1996-2006)	2007-2008
Getah jelutung	Ramin	Meranti	Gemor
Getah hongkong	Meranti	Gemor	Rattan
Getah Kotiau	Jelutung	Rattan	Damar
Hetah Nyatu	Ulin	Kemedang	Honey
Rattan	Belangiran	Belangiran	Kalanis Root
Damar	Kemedang	Kruing	Deer
Ulin	Kruing		Snake
Meranti	Gemor		Meranti
Animals (Snake, Bird, etc)	Rattan		Kruing
	Animals (Snake, Bird, etc)		Benuas
			Kemedang

Source: Suyanto et. al., 2009.

2.2. The importance of gemor to peat land ecology

Gemor is a perfect candidate for the project because it grows on peat land forest with soil acidity (pH) 3to 4 and depth of peat of 1-2 meters (Panjaitan, 2009, Wahyu 2003). Better management of peat land forests, will increase the availability of gemor. It should be noted that gemor collecting demands the existence of waterways to have access to deep peat stock, thus *tatah* or other waterways are critical to gemor supply. For this reason, gemor provides income for both those who are collecting it as well as the owner/manager of the waterways.

One of the three major emission reduction components of the KFCP is reforestation or tree planting in degraded peat area in block A beyond (the other two are drainage reduction and fire control). Gemor is an NTFP species that is ideal for inclusion in rehabilitating peat land near villages. It can increase local interest in maintaining peat swamp forests and provide an incentive for reducing logging-related activities by local communities (Mott MacDonald, 2009).

Furthermore, gemor traders and end users in Banjarmasin provide a higher value for gemor from swamp land than from mineral soils, since the gemor from trees on swamp lands is usually thicker and contains more “glue/resin” compared to gemor from mineral soils. This provides additional financial incentive to sustainability manage of peat lands.

3. Gemor productions and supply

Current data suggests that the availability of gemor is declining in the KFCP area. The literature study for this report (Wahyu, n.d; Panjaitan, 2009) suggests that gemor supply is being depleted in the area. ICRAF reported that, in the past, gemor trees with diameters of around 90 cm were available in the forest, producing around 500 to 700 kg of dried bark. Their respondents report that the situation has changed, and currently only limited numbers of gemor trees are available, and these have an average diameter of around 5-15 cm, producing only around 10-20 kg of dried bark. Furthermore, it is also reported that even though gemor resources are being depleted, there are no attempts at domestication of gemor trees for cultivation.

While it seems that gemor is a major product of the area, data on the commodity is erratic. Table 4 provides the statistic of selected forest product, including gemor, during the period, 1998/1999, 2004 to 2007 and 2009. According to Panjaitan (2009), although Gemor is on the list of NTFP, it is not levied by Dinas since the department of forestry put gemor under non-priority (*non-unggulan*) category of the list. As a result, both Dinas at province and district office have few statistical records on this commodity. Moreover, Bappenas (2009) suggest that the statistics on NTFP after 2005, in general, have not been properly managed because the forest product certificate letter (*SKSHH - Surat Keterangan Sahnya Hasil Hutan),* the basis of NTFP statistics before 2005, was not used after 2005.

Table 4. Selected forest products in Central Kalimantan (1998/1999, 2004-2007 and 2009)

Forest product	1998/1999	2004	2005	2006	2007	2008	2009
Rattan - *taman* (ton)	12,000,216	4,923	6,043	964	1,077	n/a	565
Jelutung latex(ton)	19,000	6,000	-	120	30	n/a	60
Gemor bark (ton)	362,736	33,500	-	298	-	n/a	-
Edible bird nest (kg)	-	-	3,336	633	-	n/a	-
Rattan *Manau* (kg)	1,083,093	130	65	-	-	n/a	-
Rattan - *Sega* (kg)	n/a	32,300	27	-	-	n/a	-

Source:
1998/1999: Department of forestry and estate, 1999; cited in Putir and Limin, 2000.
2004 – 2008: Central statistics 2008; cited in Bappenas 2009.
2009: www.kalteng.go.id

The statistics suggest that gemor production is decreasing with no data recorded for 2007 to 2009. Even though the reliability of data in table 4 is uncertain, discussions with traders, processors and Dinas officials indicate that the downwards trend of gemor business is plausible. Nevertheless, the surveys conducted by ICRAF and CARE in 2009 and interviews with local traders conducted by the writer indicate that gemor was, and is being, extracted by the communities in Central Kalimantan and sold in Banjarmasin markets. A publication in Kompas newspaper dated 13 July 2009 also report that gemor extraction increased during summer 2009. When asked about this data, Dinas officials claimed that they failed to capture gemor trading in the area because (1) gemor extraction is too small compared to other product and (2) there is no regulation/permits/levy both at district and province level that specifically address gemor.

The following facts are likely related to the decreasing supply of gemor:

1. *Unsustainable extraction practice:*

   Gemor is harvested using the following methods:

   - Felling of complete trees and removing the bark. This practice is not recommended since it will lead to rapid depletion of gemor.
   - Harvest part of the bark. No more than half of the bark is harvested and the tree is left to recover and the bark to re-grow. This practice is recommended since it will lead to sustainable gemor extraction.

   Unfortunately, based on our interviews most of collectors uses the first method rather than the latter. The collectors prefer to fell the tree and harvest all the bark because there is no

local ownership system for gemor trees (Suyanto et. al., 2009). Since every villager had free access to harvest gemor in the forest and extract it, there is no incentive for the collector to use the recommended method.

In addition to that, during the dry seasons, fire is used to clear undergrowth to have better access to the trees.

2. *Urbanization and other agriculture work*

As previously noted, the community extracts gemor from local forest. For them the decision to collect gemor or conduct other activities depends on the income gained from the work and how hard the work is compared to the other alternatives. The price of gemor is an important factor for their decision to collect gemor.

The collection costs for gemor for villagers involved in gemor work are as follows (Suyanto et. al., 2009):

- Farmers usually go to the forest in a group (family) for 7to 14 days to search for and harvest the bark.
- Non-labour cost for such an expedition are around Rp. 525,000/group for food, levy to enter tatah and gasoline for 13 person-days in the forest.
- In one trip a group can harvest 430 kg of gemor bark and transport it back to the village by boat ('kelotok').
- The price for dry gemor in the study site at the time of survey was Rp. 4,000 per kg. (The Palangka Raya price was reported to be Rp. 6,500/ kg).

The above points provide an estimated net income equal to Rp 89,179 per group per day.

Our visit and interview in Mentangai Village, late February 2010 suggest even lower figures than the above:

- Pak Haji has more than 200 suppliers and finance 30 groups (families) to go to the forest and collect the Gemor. Each group receives 300 to 350 thousand rupiah in advance for 10 to 12 days work in the forest to collect gemor.
- These groups then sell their gemor to pak Haji. Total supply from his financed group in average is estimated at 5 to 7 ton of Gemor for two week work, suggesting that each group only collects an average of 200 kg of gemor.
- Pak Haji reported that the price of Gemor was Rp 5,000 at the farm gate.
- Thus each group earned a gross of Rp. 1,000,000 per trip and netted between Rp. 700,000 to 650,000.
- If each group averaged 4 persons per group and spent 12 days collecting gemor, the income per person day would come to around Rp13,400.
- In total Pak Haji buys gemor from 300 to 350 villagers on regular basis. It is estimated that 400 ton of gemor were collected and sold in 2009.
- The price of Gemor at village level was reported Rp 5000/kg at the end 2009. Price in Banjarmasin was Rp 6500 to 7000/ kg.

The above points provide an estimated gross income approximately equal to Rp 13,400 per person per day (or Rp 53,600 per group/day) at farm gate level, which is below the Suyanto et. al. figure (net income pre group/day Rp 89,179). These figures are lower than the local daily wage for agriculture, which according to Suyanto et. al. (2009) is Rp. 30,000. In addition, a clear and emerging competitor for this work is working for oil palm estates near the villages. This work provides a secure and continuous income of Rp. 41,000/day.

It should be noted that since gemor is extracted from natural resources, there is always a risk of failing to collect enough gemor to cover the expedition cost. That this is a common is confirmed by traders who finance gemor collecting expeditions.

In terms of workload, collecting gemor is heavy work and demands long stays in the peat swamp forests under relative difficult circumstances. This is not an attractive job for the youth of the villages. A large collector in Mentangai (Kapuas District) suggests that none of his sons will continue his gemor business because they don't want to spend days in the forest and prefer to work in the city (Kapuas and Palangka Raya).

3. *Rapid expansion of palm oil and other commodity estates*

Panjaitan (2009) suggest that rapid expansion of palm oil and commodity estates have had a significant effect to gemor supply. Gemor production increases and then decreases as the forest is cleared and land is converted to agriculture and oil palm. The results of our interviews in Tumbang Nusa and Palangka Raya are in line with this. The traders in Palangka Raya and Tumbang nusa said that they had significant supplies of gemor at the time of survey (end February 2010) because of the rapid expansion of palm oil. Working together with palm oil contractors, they collect the gemor as forests were cleared and converted to palm oil estates. This practice provided a surge in the supply of gemor for the short-term, but will kill the sector in the long term.

4. *Technical aspect and Land tenure*

Replanting gemor and silviculture seems a logical option to maintain the gemor supply in the future. Technical guidance of this matter is provided by Wahyu (n.d) and preliminary work has been conducted by Forestry Research Center (BPK) in Banjar Baru and the Assessment Institute for Agricultural Technology (BPTP) in Samboja. Since their work is preliminary, more still needs to be done, including applied technical research to understand the propagation of gemor, its suitability to local peat lands, and the most feasible/practical methods to propagate and manage gemor.

Pak Haji, the trader active in Metangai, has indicated that he would be interested to participate in activities that will support the sustainable availability of gemor in the future, including the planting and the silviculture of gemor. Since this would be a long-term investment, he advises that land security is a critical issue. According to him there have been cases where villagers invest their time and money in communal land, but then they found that their land was converted to palm oil plantations and they received a very minimal payment for the land. These experiences have increased the wariness of local villagers to investing in insecure land (common land).

The following excerpt from Suyanto et. al. report (2009) is worth quoting to describe the community's perspective of the commodity:

> *"However, villagers did not feel confident about the future of gemor harvesting. This was based on the difficulties they encountered when carrying out gemor harvesting in the forest, such as:*

(1) Trees were increasingly farther away from their settlements and more difficult to reach. (2) Gemor trees were difficult to find and those that they could find were small. (3) Farmers would harvest gemor of any size, thus there was no chance for a tree to reach a large diameter. (4)Forest fire and over harvesting threatened the growth of gemor trees."

4. Beyond-farm gate aspects and gemor demand

The product flow and supply chain of gemor are simple. The following actors are active in gemor supply chain:

- Farmers/villagers work as a group to collect gemor in 10 to 12 days forest expeditions. Once collected the gemor bark is then dried to reduce its water content.
- Gemor tree bark is then transported to the village for further drying and then sold to local wholesale collector. Farmer receives a premium price for dried product and a discounted price for wet product. Price per kg gemor in 2009 at farm-gate was approximately Rp 3,000 to 5,000 per kilogram.
- The Traders collect gemor from farmer and conduct further drying process (if required). The price from traders to their buyers in 2009 was approximately Rp 5000 to 7000 per kg.
- The Gemor is then transported to Banjarmasin for grinding, further processing or sent in bulk to Java.
- There are at least 4 large scale buyers in Banjarmasin.

  (1) PT SAM is a grinding facility that grinds gemor bark and coconut shell (4 part coconut shell + 1 part gemor bark) for his consumers in Jakarta, Semarang and Surabaya. His buyers are large scale mosquito coil producers.

  (2) Tantono, a large scale gemor trader.

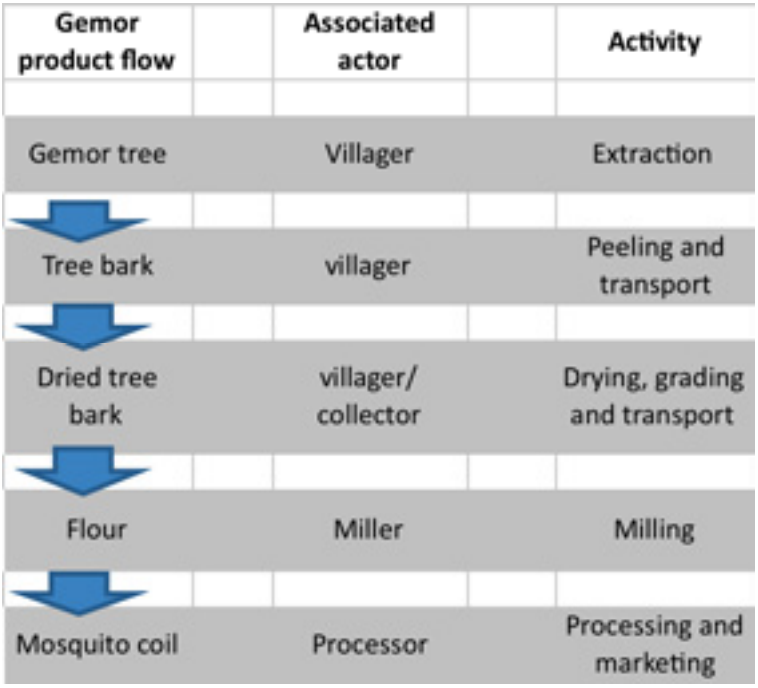
  (3) Tono, a large scale gemor trader with milling facility.

  (4) PT. Kalimantan Protek Utama, a mosquito coil producer for the local market. Their production facility is located in Liang Anggang, South Kalimantan

- The end users of Gemor are mosquito coil producers. Most of these end users are Java based companies with international connections. The market leaders are: Baygon, Fumakilla -Jakarta (trade mark: Vape), Kuda Raya- Surabaya (trade mark: Zebra) and Reckitt and Benckiser (trade mark: Tiga Roda).

Figure 1 provides a summary of gemor's product flow, value chain actors and associated activity of each value chain actor. The table shows that gemor supply chain is short and simple with most of the processing work conducted in the processing facility. Our interviews suggest that access to information is shared almost perfectly among supply chain stakeholders. The majority of farmers and traders are well informed on latest price information and understand that the end users of their gemor are mosquito coil producers.

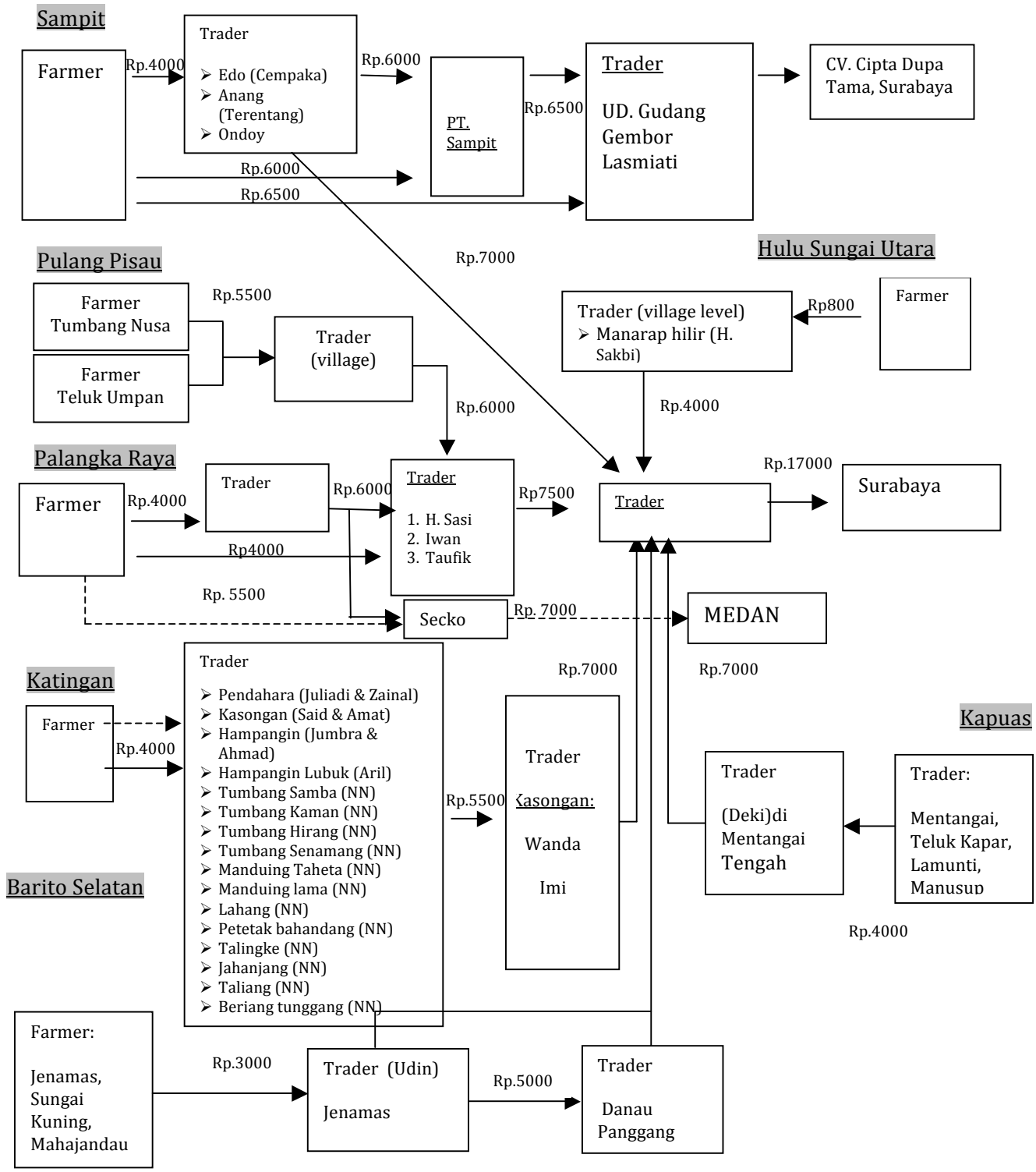
Figure 1. The product flow, value chain actors and associated activity of each value chain actors.



Source: own survey.

Since most of gemor from Central Kalimantan goes to Banjarmasin market, it is worth looking at the work of Pajaitan (2009) that studied the gemor supply chain in both provinces (South and Central Kalimantan). Panjaitan (2009) claims that Banjarmasin has the largest market for gemor in Kalimantan. Figure 2 shows the summary of Panjaitan (2009) study and provides an overview of gemor trading in South Kalimantan and Central Kalimantan.

Figure 2: Overview of Gemor trading in South Kalimantan and Central Kalimantan (Panjaitan, 2009)



Our interviews with beyond-farm actors suggest the following sector characteristics:

- Gemor supply chain is not complicated; most of the traders and collectors have been in business for more than a decade, therefore trust and networks are have usually been in place and maintained for years.
- There are relatively few problems in term of quality. Only a few farmers mix gemor bark with bark from other trees to increase volume. The main problem with regard to quality is the viscosity and water content, which easily solved by further drying.
- Some traders report problems with the continuity of supply. There is time when gemor is difficult to find and the quantities delivered are insufficient.
- Prices are volatile. The price of gemor bark has decreased from Rp 7500 per kg (early - mid 2009) to less than Rp 4000 at the farm gate level at the time of survey. Base on traders' information, the most recent and most significant drop of gemor price was in November 2009, caused by imported gemor from Vietnam. The price of imported Vietnam gemor (flour with mesh >80) is 4,031,000 IDR/MT or approximately equal to 4000/kg, while the Indonesia farm gate price per kg gemor (tree bark) in 2009 was approximately Rp 3,000 to 5,000.

The impact of the price crash due to imported Vietnam product creates a bad prognosis for the demand of Kalimantan gemor in the short term. The following are reported examples of the impact of the price drop and competition:

- Except our respondent in Mentangai, all of traders interviewed are not in the business anymore. Most traders have shifted to other NTFP products such as damar and jelutung.
- The Mentangai trader is the only one collecting and sending gemor bark outside the Kapuas region. Others have left the business. His business size at the time of survey was only 70 percent of normal activity in 2009.
- A key miller in Banjarmasin has stopped milling gemor since November 2009. Their operation has shifted to milling coconut shell. At the time of the survey, they indicated that they were happy to buy gemor for a maximum price of Rp 3000 per kg at the warehouse gate, which means that the farm gate price would need to be less than Rp 2000 per kg.
- Tanoto, said to be the largest gemor trader in the province and had been in business at least for two decades (20 years), has decided not to continue his gemor business in 2010 and shift to the livestock business.
- PT Kalimantan Protek Utana, the only mosquito coil producer in Kalimantan, stopped producing mosquito coil in November 2009 and shifted to coconut shell business.

It is not clear, how long will the price pressure last, but the long term demand of Kalimantan gemor will depend on it.

5. Discussion and conclusion

5.1. End user perspectives

According to the literature, the end users of gemor are mosquito coils producers and joss sticks producers *(dupa cina)*. This section focuses the discussion on the use of gemor bark for mosquito coil producers rather than joss-stick producers for the following reasons:

- There is no standard specification for joss sticks; therefore it is difficult to track down the use of gemor by joss-sticks producers. An internet search on the use of gemor for joss stick production resulted in non significant information.
- Most traders and collectors of gemor bark in Kalimantan are not aware of any demand of gemor bark from joss-stick producers.

For the mosquito coil producers, gemor is an important product because of the "glue/resin" of gemor bark contains 1.80% Pyrethrin, an active ingredient for mosquito repellents. Unfortunately pyrethrin is only one of active ingredients for mosquito coils. Other active ingredients found in mosquito coils include some of the following (Daniel, Frances and Debboun, 2009):

- Pyrethrum (Natural, powdered material from a kind of chrysanthemum plant; performance moderated)
- Pyrethrins (Extract of insecticidal chemicals in pyrethrum)
- Allethrin (sometimes d-trans-allethrin) (The first synthetic pyrethroid)
- Esbiothrin (A form of allethrin)

The above points show that there are substitutes for gemor. As the price of gemor increase or the availability decrease, the mosquito coil producers can always switch to chrysanthemum flowers (pyrethrum) or its synthetic chemical.

The "glue" characteristic of gemor bark also important for the binding process of mosquito coil production, but our interviews suggest that it can be substituted by starch flour which has better availability than gemor.

According to Toendan, the CEO of PT Fumakilla, the market share of mosquito coil in Indonesia is dominated by 3 brands, namely Tiga Roda (produced by Reckitt and Benckiser – 40 percent market share) Baygon (produced by Bayer Indonesia – 35 percent market share) and Vape (produced by Fumakilla – 15 percent market share) (Sinar harapan 2003). These three brands hold approximately 90 percent of Indonesia mosquito coils production.

Since the producers are multinational companies, they have the networks and ability to source the most efficient and cheapest ingredients for their products. An initial contact with one of these multinationals suggest that they still prefer to use gemor for their facilities, but price remain the most important criteria in choosing to use gemor or other ingredients given the price competition for their product. Given the price of imported gemor at the time of survey, which is 30 – 50 percent cheaper than Kalimantan gemor, using imported material is definitely the best option for mosquito coil producer to minimize costs and maximize sales.

Our interviews with Banjarmasin based traders who normally sell their gemor to these multinationals suggest that demand has significantly dropped and that most of the traders in

central Kalimantan and south Kalimantan are shifting their business to other NTFP products, coconut shell, and livestock.

5.2. Options and Conclusion

It can be concluded that the demand of local gemor at the time of survey was very low, whereas supply was relatively high, but only for the short term due to the one time boost from forest conversions to oil palm. In the medium to long term, the trend is for continued dwindling of supply, as forests are converted and current stock unsustainably exploited.

In the short-term, the price pressure and market downturn provides a disincentive for any market interventions. It will be very difficult for the KFCP project to work with the local value chain stakeholders if the market remains volatile and confidence is low among the stakeholders.

For the medium and long-term perspective, gemor remains a viable option for the project. Three simultaneous interventions are important for the project.

1. Supply driven programs:
   This is mainly to secure gemor supply via silviculture and better Peat Swamp Forest Management systems. The activity would be to replant and manage gemor growth and harvesting in the area. Aside from replanting, training and capacity building to improve both business management skills and technical aspects of gemor farmers would be at the core of this program.

2. Land tenure assurance
   Assuring clear land tenure and rights to gemor is important and needs to be included as supporting activities in the project. As most of the gemor grows on a communal land, a "tragedy of the commons "[2] is likely to happen if gemor gains more value in the market. The "tragedy of the commons" is an inevitable process that leads to the destruction of commonly held resources open to public and free for exploitation; the free access results in over-exploitation of the free resource to the detriment of all resource users. To prevent "the tragedy of the commons", a facilitation strategy needs to be developed to manage access and extraction of the communal resource – in this case forests and gemor.

3. Market driven linkages programs.
   This is mainly to secure the market and to enhance and improve gemor supply chain efficiency for the local actors – in particular to supply quality product at a competitive price on a reliable schedule in order to compete with imports and other substitutes. A detailed value chain intervention strategy should be developed together with supply chain actors and stakeholders, driven by market demand. REDD fund can be used as an economic incentives to enhance the process and provide better policy and business enabling environments.

At the time of this report, the gemor market in the area faces a number of challenges – dwindling supplies in the medium term, competition for labour, and competition from gemor substitutes. On the positive side, gemor has many characteristics that make it preferable for the end users. This provides an opportunity for developing strategies to rebuild the gemor supply industry for the medium to long term in the KFCP area.

[2] http://www.sciencemag.org/sciext/sotp/commons.dtl

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