

Threat to The Peat Region and Ecosystem (The Early Study of Restorasi Ekosistem Riau (RER) /Riau Ecosystem Restoration in Kampar Peninsula)

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ABSTRACT

The Kampar Peninsula is the biggest remain peat swamp forest in Sumatra which located on the eastern Sumatra coastal line and has 473.000 hectare of natural forest. This Peninsula has 4 conservation regions; Danau Pulau Besar Conservation (28,237ha), Tasik Belat Conservation (2,529ha), Tasik Besar / Tasik Metas Conservation (3,200ha), Tasik Serkap / Tasik Sarang Burung Conservation (6,900ha). Tasik Belat, Tasik Sarang Burung, and Tasik Serkap are the small conservations seperated by rivers and lakes. Since being declared, the Kampar Peninsula is threatened by illegal lodging, demographic tension, the use and the domination of lands, hunting and conflict among humans and animals.

INTRODUCTION

One of the unique formation types of forest is the ecosystem of peat forest and peat swamp forest. The peat forest is located behind the river's dam. The peat forest has alluvial land (entisols) and land of organics (histosol). peat swamp forest is located on a plain area and between 2 big rivers. The uniqueness of peat forests is located on peat plant which forms dome having a difference of height. The Kampar peninsula has peat forest ecosystem which is located between Siak River and Kampar River, so it is certainty that the area has a large of peat dome, although until now there is no a comprehensive study in the area yet.

The total of peat forest in Sumatra is around 6,29 million hectare and around 4,3 million hectare is located in Riau Province which spreads in *Bengkalis* (2.336.239 Ha), *Indragiri Hulu* (93.200 Ha), *Indragiri Hilir* (983.623 Ha) *Pekanbaru* (8.464 Ha) and *Kampar* (881.323 Ha), with a depth circa 3-10 meter². According to the data of data Centre for Social and Agriclimate Research (CSAR) in 2002, the Riau Province has the biggest area of peat forest in Indonesia which is 3,8 million hectare spreading on 160 kilometres on the eastern coast the province. During years, the forest covered the peat area has been exploited and conversed without a deep thinking. It affects on the destruction of water management system, fire peat forest, a lost of biological diversity and carbon also climate change.

A region of peat forest that still remains in Riau Province is in Kampar Peninsula, which is one of the widest peat forest in Sumatra. Kampar Peninsula Ecosystem (KPS) is a peat ecosystem which has 2 peat domes as core area with a dept of circa 16 metres. The Peat domes have an important role in water

management and keeping a large amount of carbon (Greenpeace, 2009: 200 Giga ton Karbon). The high demands of space from private sector and public make the existence of this region of peat forest threaten. To avoid the negative affects on KPS, it is needed to have a good management through a ripe planning based on comprehensive and deep scientifically studies, which one of those is ecosystem restoration program.

Ecosystem restoration program is a biological and non biological unsure recovering process on the degraded ecosystem of productive forest, so the balance of its biology and ecosystem recreated. The program is an effort to reproduce biotical unsure (plants and animals) and non biotical unsure (land, climate and topography) in the region of productive forest through working plan, which includes activities to protect, to assess, to restore and to manage the ecosystem concession, the land, the water, the plants and the animals.

The ecosystem restoration program (known as Riau Ecosystem Restoration/RER) takes place in Kampar peninsula as one of the widest peat swamp forest in Sumatra, which has peat dome as its core area and keeps carbon in very big amount. This restoration program has a purpose to build an area in the productive forest that has an important ecosystem in maintaining the function through conservation, protection and rehabilitation of forest ecosystem.

The RER policy began when Permenhut SK.159/Menhut-II/2004 about Ecosystem Restoration in productive forest was issued. As the permission holder in Kampar Peninsula in Pelalawan District, APRIL/RAPP has an interest to realize the conservation of peat ecosystem which is conducted by PT Gemilang Cipta Nusantara (GCN). GCN—a holder of IUPHHK-RE via Keputusan Menteri Kehutanan No: SK.395/Menhut-II/2012 dated on 24 July 2012—runs the commitment of APRIL/RAPP through a program of 4 stages in restoration, such as; protecting the forest region in Indonesia which faces threats of illegal logging, illegal open land, and illegal animal hunting, forest fire, and degradation of water content of peat forest.

The RER program is planned to include the protection strategy, to guard and to patrol together with the society and all stake holder. However, before the program is operated, of course, the deep studies are needed regarding the acceptance of RE program from the people and village officer. The society' response and justification are needed before the program implemented. Moreover, the program needs a cooperation from the society and stake holder. Therefore, the report of this paper will explain the respons and justification of society regarding to RER conducted by GCN. It will explain the threat and the problems found in the research of Kampar Peninsula.

THE FRAMEWORK OF THOUGHT

This framework of thought leads and puts the forestry development position on wider context, especially in the role of forestry development to maintain natural resources and to realize the community's welfare. Moreover, this development must put the basically philosophy of forestry development in national development system. In this context, there must be a demand of fundamental changes in every aspects

existed in that forestry development, including the physical the forest and the human resources.

The science of forest development born in the Central European countries in the 17th century as the forest reform issued by King Louis XVI in France. After that, France built a forestry high school with the students came from France, Austria, Germany and Switzerland. It was the beginning of the forest management and the utilization concepts. Although in the next development, the Germany—by Heinrich Cotta—was able to develop the forestry sciences faster than the France since 18th century until the middle of 20th century. Germany was the sources of forestry sciences all over the world, and it affects the Indonesian development. The German forestry science was implemented in the 19th century to manage the teak wood forest in Java by a German forestry architect named Mallier. The dutch forestry scholars were also alumnus from Germany. Therefore, the influence of German forestry science could be seen until nowadays, especially in Java (Simon, 2011). At the beginning, the forest utilization in the 17th century in Java was intended to not be sold but to build a boat for the trade. (Peluso, 2009)

The development of forestry sciences in Germany was different in USA, since its different condition to Germany. In the USA, the forest is very large with the population density is lower than Europe. Moreover, the development of forestry science in USA took place when science and technology was advanced. The color of USA forestry science can be seen in the management of natural forest outside Java by the holder of Hak Pengusahaan Hutan (HPH)/Rights to Use the Forest. (Simon, 2011).

Although there is a difference between the German and the USA forestry science, there is “the red line” from them that is a strong tendency in “the forestry techniques” aspects compare to other aspects, especially in the social community aspect around the forest. Hence, “the target” of forest management is focused on the wood supply for industry to fulfill the need of city and export. It is clear that the policy of forest management in Java and outside Java lies on the government political will. This political will is needed to determine the forest management strategy in Indonesia.

The above picture gave information that since the beginning of the forest management system in the world the idea and the direction of of forest management (especially tropical forest) were not focused on the maximum utilization for the society’s interest. Hence, the importance of forest products to the rural community was still less. Since at that time the taken policy was to protect and to exploit the forest for the sake of colonial economic stability.

The conventional forestry development strategy, as explained above, was based on the following assumptions (Wiersum, 2008): First, forest gives a role in producing raw materials and environmental services, so it is needed to make a balance between the role in its managerial system, so the forest may multi purpose achievable. Second. Forest not only gives positive influence locally, but also regional condition widerly. Third, the production cycle in forestry activities needs a few years. The consequence from that basical assumption is to bear a view that the forestry

management is good if the reserve of forest is legally guaranteed and professionally managed.

The main objective of forestry management as mentioned above is to conserve the forestry resources scientifically and be used wisely through forestry exploitation that gives multiply benefits for the woods processing industry. However, in many facts, this activity is contradictive. Many cases in the world, such as in Brazil, Malaysia and Indonesia, the local community activity using forest is seen as the destructive and deviant activities, therefore, they must be avoided and forbidden. In fact, the consequence of that view is that the community feels their access to the forest reserve is limited by rules vanishing their "lebensraum". Usually, the rules show up as a reaction of community activities such as migrating land, illegal lodging, collecting forage, the food planting and other forestry commodities in the forest area.

Indonesia, as a country, has wet tropical forest as large as 143 million hectare and population circa 200 million lives. The forestry management so far still focuses on wood exploitation, because from this wood exploitation the fund for development may be achieved quickly. On the contrary, efforts to conserve the exploited natural forest still face many difficulties and not as smooth as the lodging activities. Even, until now, the protected forest region has not gained a serious attention. The implementation of productive forest exploitation keeps running, since it is an integral part of national development. Therefore, the forest utilization keeps referring to the national economics development strategy.

The beginning of Orde Baru (New Era Order) signed by "new era" in Indonesia's economy where the national private sector gained a chance, a full support and facility from the government. But, the situation changed, the private sectors might do an effort alone. The same situation appeared in forestry industry outside Java.

The development of pure private business in forestry started when Undang-Undang Penanaman Modal Asing (PMA)/Decree of Foreign Direct Investment in 1967 and Undang-Undang Penanaman Modal Dalam Negeri (PMDN)/Decree of Local Investment in 1968 were issued. The philosophy based the forest utilization outside Java was to use forest for collecting foreign exchanges in order to run the national development. Then, the approach was "extractive" and refined through wood industrialization approach to increase the efficiency and added value of foreign exchanges. So that the target of using natural forest outside Java was stressed just on industry and export. Therefore, the strategy of forestry management outside Java has not been changed compared to the forestry utilization orientation in its science developed in Germany in 19th century.

Forest management strategy which is oriented at industry and exports as explained above, for a country like Indonesia that has a lot of human and natural resources from ground aside from the forestry sector is getting "rare", therefore, forest management strategy has a challenge which is to find "a new paradigm" in its development, because if this paradigm is not soon applied and implemented, degradation and deforestation of forest areas can not be prevented in the future. The paradigm that is suitable with the needs that Indonesia has at this moment is the

good management of forests in Java and outside Java by using the *Social Forestry approach*.

Planners and users' lack of attention on the three aspects of social, economic, and cultural, especially regarding the people inside and outside forest areas, has caused a complicated problem. If this problem persists, it will make it even more difficult for the position and all activities of forestry development (forest use and forest maintenance). It is inevitable that the decrease in the forest quality such as degradation and deforestation will be higher in the future, especially in developing parts of the world that have vast forestry resources. To anticipate this problem and to reformulate the strategy of world forest development, the three important aspects mentioned before should be included in all phases of planning and implementation of the forestry development.

The moral foundation regarding the *social forestry* (kehutanan sosial) paradigm has been discussed a lot by experts that have high social awareness, frequently proposed by social scientists and forestry experts themselves. Loekman Soetrisno (2010) writes that for the people whose lives are closely knitted to the forests around them, they think of the forests as something that has two crucial functions: first, the people think that the forests can solve their life problems continuously when the people need to face the need for land for agriculture to fulfill the needs of their families; and second, for poor people, the forests are also sources to get dry wood, building material, and mostly extra protein, and also hunting ground and the place for them to find food. So it is obvious that the forest management as conducted by the HPH companies in Sumatera and Kalimantan at this moment, does not meet the criteria of the moral foundation that the society sees. Facts have proven that HTH companies have caused a lot of conflicts with local societies.

The above mentioned point of view underlines one very important thing which is the development strategy that is oriented on modern economic sector has caused bad effects on modern economic sector and traditional economic sector; it is also worse that there is marginalization of many levels of society, including people who live in the forest areas. As a result it is of a very high importance to create an alternative strategy in forestry development that can also have an active role in rural development. The starting point of this *social forestry* strategy is based on the theory proposed by Loekman Soetrisno above, where "basic need" problems are approaches to design and implement forestry development activities. Meanwhile the forest use base regarding optimum forest use and sustainability has been developed based on the basic needs, equality, and social participation. From the economic aspect, there has to be interconnection between modern forestry industry and forestry industry that is closely related to the local people's economy.

Definition-wise, *social forestry* has numerous meanings, a different expert thinks about 'social forestry' differently and the meaning of it also depends on the case that is investigated and where the case is found. According to Wiersum (2008), what it means by the *social forestry* concept (kehutanan sosial) is a strategy of forest management that tightly involves local people in all forestry activities. In this case, the people are held responsible and they find many benefits by doing their business in their forestry activities. This kind of forest management gives special attention to active participation from local organizations and local people regarding

forest resources management. Meanwhile according to Simon (1991), social forestry is a forest management strategy that puts the local people's interest first. The consequences of this system are that there must be a fundamental change in behavior/attitude, of the forest users for the sake of processing industry and export for the local people's sake. This is not a simple change because it is about change of perspective of planners and decision makers. A more operational definition of *social forestry* was stated by Tiwari. According to her (2013), *social forestry* is a science and art of planting trees or other plants on any available land, in our outside the already managed forest areas, by involving local people actively. This activity is combined with other activities that can produce a kind of land use that is balanced and complementary. The purpose is to come up with various kinds of products and services dan for individuals or society in general. Thus, the main purpose of the social forestry program is to create improvement in social and economic conditions of the people near the forest. That achievement can only be had by the increase in active participation of local people in managing and using forest resources.

In accordance to this participation, Noronha and Spears (2008) stated that what matters in forestry activities is how far involved the local people are in planning, altering, and implementing a project and things that show that there is a connection between formal and local parties. Local people's participation or local participation can take place only by understanding the social structure in the society and the society's needs, by communicating with people regarding the techniques used, by explaining the meaning of the project to them, by reaching agreement with the people about the program. Therefore, people have to be convinced that any forest activity will give them benefits, not other people. Support from local people is a very important thing in a social forestry project because if it is without participation from local people, the forest resources management and its resources sustainability can not be guaranteed, and without a good participation concept, the social forestry becomes vague (Loekman Soetrisno, 2010).

The problem is forests in Indonesia are centered in Java and outside Java, where both locations have very different social, economic, and cultural values. If the strategy of *social forestry* to be implemented, micro and territorial studies are specifically required. For example, to understand the structure of the rural society a sociological and anthropological approach is needed. Overall, the problem regarding forest resources and rural societies need to be carefully understood/studied by carrying out surveys by using the PRA and RRA patterns. This study hopefully can identify the problems faced by the rural society in the cape of Kampar especially in the coming implementation of RER. Having mentioned that, the *paradigm of forestry development of Indonesia* can be more meaningful to all societies and it is relatable to the real problems faced by rural societies.

METHODOLOGY

Data and information collection was done by implementing an indepth research. Data collection technique is performed by doing participative observations by using a Sosio Antropological approach.

Primary data collection was done by doing interviews and spreading questionnaires and interview guidelines. Direct recording was also carried out in the field, especially regarding cases found during the research. Secondary data covered publication, local government's inventory, previous research results, and other relevant material.

Methodology used in this study is:

1. Field survey, to get actual picture and information about conditions of social aspects related to the restoration in the area of Semenanjung Kampar.
2. Literature study, to identify and assess related and relevant secondary data.
3. Data analysis, this means field data, secondary data, and map analysis (spatial analysis).

GENERAL DESCRIPTION OF SEMENANJUNG KAMPAR

Semenanjung Kampar is the largest peat land remain in Sumatra located in the east skirt of Sumatra Island. This area has about 473,000 hectares of natural forest¹⁰, geographically Semenanjung Kampar is borders on the South side with Kampar river and North side with Siak river, on the East with Selat Panjang and on the West with palm oil plantations and Hutan Tanaman Industri. Administratively, Semenanjung Kampar is under the control of Pelalawan Regency and Siak Regency in Riau Province. In Semenanjung Kampar there are 15 villages inhabited by 27,000 people who economically have direct interest with this region.

Semenanjung Kampar has are four conservation regions (Suaka Margasatwa) consisting of the 37,000 ha Danau Pulau Besar Park (28,237 ha), Tasik Belat Park (2,529 ha), Tasik Besar / Tasik Metas Park (3,200 ha), Tasik Serkap / Tasik Sarang Burung Park (6,900 ha). Tasik Belat, Tasik Sarang Burung, and Tasik Serkap are small conservation areas that are separated and full of peat lands, rivers, and lakes.

According to the regional regulation or Peraturan Daerah (PERDA) year 1994 about Riau Land Use Plan / Rencana Tata ruang Wilayah (RTRWP) Riau, this region is made as Protected Peat Land Park / Hutan Lindung Gambut (HLGB) of 248,800 ha. Land Use Purpose is based on *RTRWP – Riau 1994, PERDA 10 1994*. The regent and government of Siak Regency have also proposed area extension and change in the function of SM of Pulau Besar Lake and Pulau Bawah Lake to be National Park to Minister of Forestry in a letter no.660/set/100S/2001 and no.364/Dishut/205/2005 dated Juni 9th, 2005 .

President decree states that this region is HLGB according to President decree (KEPRES) no. 32 year 1990 about management of protected area especially art no.9 and no.10 stating that peat land with more than 3 meters deep has to be made HLGB.

¹⁰ Interpretasi peta Citra, Jikalauhari 2005

THREAT TO REGION AND ECOSYSTEM OF SEMENANJUNG KAMPAR

Main threat found in Forest Region of Semenanjung Kampar is to the stability of the peat land hydrology itself. If the stability of the hydrology is disturbed under **water table** continuing to dry peat that is non-returning, then it will stimulate other threats such as peat land fires, eco-diversity loss, society losing its income sources as fishermen and farmers. If peat fire occurs, there is carbon release to the air that affects “global warming”.

There is **pyrite** compound (FeS_2) in peat land, when peat land is wet, the compound is stable, but when it is oxidized, a problem will happen. Quality of water will drop and that will affect existing biota. If peat land is opened until the water surface (**water tabel**) drops to the surface of **pyrite**, it will poison plants (Noor, 2001), it is also easy for a tree to fall because of the **subsident** as it is prone to fire. Based on the intensity and fragility level, there are some activities that can bring threats to the existence of the eco-system of the forest in Semenanjung Kampar:

1. Illegal Logging

Threats are:

- a. Weak law enforcement because of corruption, incomplete regulation entity, lack of resources (personnel and fund).
- b. Access such as rivers, canals, HTI roads, and HPH rail roads.
- c. Supply and demand imbalance
- d. Poverty.

Besides, in the intervension region, illegal logging activities are also identified as the results of inconsistent policies regarding the status of available regions. Threat from illegal logging also takes place in the extention region and intervention region. Threat from **illegal logging** is still pretty high to SM Kerumutan coming from local people who use Sungai Kerumutan and Kampar river in Pelalawan, Batang Rengat river and Mengkuang in Inhu, as well as Gaung river, Gaung Anak Serka and Terusan Siam river in Inhil.

2. Poaching

Source of threat as a result of :

- a. Lack of understanding and awareness in people about wild animal protection
- b. High demand for Sumatran tigers, bears, crocodiles, arowana fish and their body parts in black market.
- c. Weak law enforcement.
- d. Frequent conflicts between humans and animals.

Poaching of wild animals especially Sumatran tigers is high along Gaung river and Kampar river because it is related to the fact that there are so many buyers,

there is access, and close Malaysia and Singapore as the places to sell them. It takes only a night to get to Malaysia and Singapore by a small boat through this river. There are 12 hunters and buyers of Sumatran tigers identified, 15 hunters of deer and boars (tigers' prey). Hunters of these tigers' preys sometimes catch tigers stuck in their net (YASA, 2005). Many cases of Tiger hunting are caused by high price, the omset is around Rp25 million on average, the meat is Rp.80,100.- and the body parts (whiskers, nails, penis, skull and skin) the price range is 115.700 and the whole body is Rp18.342.900 depending on the kind (Traffic SEA, 2004).

3. Forest And Land Fire

The frequent occurrence of forest fires in this region is because this region is a peat land, and when it's on fire, it's very difficult to extinguish the fire as it burns down below. Besides, this region is next to the Kerumutan forest area which has concession areas for HTI. The canal opening performed by the HTI companies will fasten the process of the carbon release, dryness of land and decrease of the water table. In the dry season this area is flammable. Forest fires also occur because of illegal logging activities and fishermen activities, but these are very small factors. This threat of forest fires is also caused by local people who have a habit of burning lands before planting corns twice a year in each coming dry season.

4. Construction of Sorek – Teluk meranti – Guntung Road

Construction plan of Sorek – Teluk meranti – Guntung road cuts some of the forest areas in the skirt of the cape of Kampar. Facts prove that road construction accelerates the damage and deforestation because roads become access to illegal loggers, poachers, and land clearers, this also happening in other areas such Tessonilo and West Coridor of the National Park (TNBT).

5. Canal And Road By HTI Companies

This access will be used by the local people to exploit forest products that are wood and non-wood from the cape of Kampar. The reality is that the companies can not secure the roads and canals from the local people that want to use and exploit the forest products.

6. Policy Inconsistency

Sources of threats are from:

- a. Issue of permit that is not suitable with purpose (peruntukan) and appropriation (kelayakan) (KLG)
- b. Issue of permit from a regent for HTI that is in verification process.
- c. Lack of commitment from Forestry Department to apply the license verification of semi-illegal HTI.
- d. Policy issued by Ministry of Forestry to accelerate the development of HTI

- e. Tendency for the provincial and regency government to develop a plantation (2 million hectares)
- f. Palm oil plantation purpose for local people that is not appropriate.
- g. Land Use of Province and Land Use of Regency not in good sync.
- h. Weak law enforcement that governs smallholders' plantations.

7. Practice Of Private Owned Palm Oil Plantation/Smallholders That Is Non-Continuous (Tidak Berkelanjutan)

Canal systems that do not consider the aspects of land and water conservation.

- a. The use of herbicide and pesticide or the use of substances that are not eco-friendly or that are toxic.
- b. The creation of plantations that does not take the areas of HCVF into account at all.
- c. The incomppliance of the companies to the area rules; areas that have to be protected, such as river banks, peat depth of 4 meters.
- d. Companies do not comply with the conflict management SOP.
- e. Local people do not have good forest fire management/animal conflict management.

CONCLUSION

- 1. There are threats to the hydrology stability of the area and nature of **hydrophobicity** that exist in peat lands: one threat source is canal making by the HTI and HPH companies. Effect: canals will dry peat lands out because canals disturb the functions of the natural water reservoir there. Peat can no longer absorb water during rainy season and release water during dry season. In a dry peat land, another threat is the seawater intrusion especially in the skirt of Kampar. Forest conversion in peat lands for acacia will jeopardize ground water reserve sources in the future.
- 2. Another threat to the biodiversity: source of threat is the making of infrastructures in supporting areas which is performed by companies that support crimes in the forests as the companies pave roads for the poachers and illegal loggers et cetera to use.
- 3. Threat to social, economic, cultural activities of the inhabitants: the people can lose their sources of income, they may lose their faith in kinds of plants and animals in the cape area of Kampar.
- 4. Conflicts between animals and humans especially tigers and inhabitants happen because of the limited roaming areas for tigers to hunt and live and areas for their prey.

5. Newcomers, especially employees of companies that catch fish by using poison and cut trees illegally.
6. General threat that causes damage to whole ecosystem of the cape of Kampar due to Conversion Policy vs. Conservation Policy (activity of giving permit to perform conversion in protected areas around SM).
7. Controversy of RTRWP (Rencana Tata Ruang Wilayah Provinsi) (Plan of Province Land Use) and RTRK (Rencana Tata Ruang Wilayah Kabupaten) (Plan of Regency Land Use) that do not go hand in hand and because of the factor of the unified RTRW (Plan of Land Use).
8. Threat from toxic substance for plants called *pyrite*: peat lands that reach subsident because of the land reclamation will cause the level of **pyrite** to increase. This **pyrite** is toxic to plants and it creates pests for farmers. In addition to that effect, **pyrite** that flows to the rivers nearby will pollute the river water and this will definitely cause the drop in the number of fish catches performed by the inhabitants near the rivers.

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