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**Session III: Projects and Activities  
on Sustainable Palm Oil**

**PROJECT PROPOSALS**

## Impact Assessment on Oil Palm Development

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### Background

#### Deforestation and Oil Palm Expansion

Indonesian forests constitute one of the world's megacenters of biological diversity. However, these forests -- 10 percent of the world's remaining tropical forests, second largest to Brazil -- are being increasingly degraded, leaving ever fewer natural resources and causing significant ecological damage.

The rate of deforestation is at alarming level reaching up to 3.8 million hectares per year, according to the Planning Agency of the Ministry of Forestry in 2003. This figure is equal to the loss of 13 soccer fields per minute. Recent assessments estimate that by 2005 lowland forests will disappear in Sumatra and by 2010 in Kalimantan.

Many factors contribute to the increase in the rate of deforestation. This includes illegal and destructive logging, forest conversion, and forest and land fires. Forest conversion can be defined as a continuous process of forest degradation, leading from natural forests over one or several steps to the replacement of forests by other forms of land use, such as plantations (including pulp woods and oil palm), agriculture, pasture, mining, infrastructure and settlements.

One significant factor of forest conversion that has been constantly under scrutinised is the conversion of forests to oil palm plantations. Many people, particularly non-government organisations (NGOs) and consumers, have a concern that forest conversion to oil palm will lead to man-made monocultures characterized by forest fragmentation and the almost complete loss of forest ecological functions and socioeconomic benefits for local people.

Nowadays, over 28 million tonnes of palm oil are produced worldwide annually and comprise a major food source all over the world. Palm oil is used in a wide variety of foods including crisps, cakes, biscuits and pastry. Vegetable oil production world-wide totals 95 million tonnes per year and palm oil is the world's second largest crop after soy. Palm oil sales are set to rise in Europe and dramatically so in the growing economies of China and India.

In Indonesia, oil palm plantations have been intensively developed since 1980s. In 1991, the total area of oil palm plantations was only 1.1 million ha. The figure increased to 4.7 million ha in 2001 with many predicts that to date the total area of oil palm has reached over 5.2 million ha (IPOC, 2004). This expansion is paralleled with the increase in CPO (crude palm oil) production from 2.658 million tonnes in 1991 to 5.247 million tonnes in 2003. According to the Central Bureau of Statistics (BPS), export of CPO and other oils in 1998 was 1.478 million tonnes and increased to 6.332 million tonnes in 2002 with the total CPO production reached 9.4 million tonnes (IPOC, 2003).



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Regarding ownerships, 50 percent of 4.116 million ha of plantations is owned by big companies while 33 percent is owned by oil palm farmers and 17 percent is owned by state owned companies (IPOC, 2003). These plantations are spread out in Sumatra, Kalimantan, Sulawesi and Papua.

The down-stream industry of palm oil has also been fast developed. Currently, the built capacities of oleochemical fatty acid, fatty alcohol, and glycerine plants or factories have reached 342,000, 90,000, and 50,400 MT/year. The export values of CPO and other oils increased from US\$1.446 billion in 1997 to US\$2.092 billion in 2002, and only during January-September 2003, the values were at US\$1.74 billion (IPOC, 2003). It is noted that palm oil is now considered as one of major incomes for Indonesia and for 3.5 million people working in this sub-sector.

However, as mentioned in the fourth paragraph, oil palm expansion generates concern among consumers and NGOs because of its environmental and social impacts. It is recognised that there are environmental pressures particularly as palm oil can only be cultivated in tropical countries such as Malaysia, Indonesia and Columbia. While some oil plantations are well managed, others have imposed social and environmental costs due to indiscriminate forest clearing (leading to the loss of high conservation value forests/HCVFs), uncontrolled burning with related haze (especially during the massive fires in 1997/1998) and disregard for the rights and interests of local communities.

For instance, based on analysis on satellite imageries, more than 75 percent of hotspots in 2002 in West and Central Kalimantan provinces occurred inside oil palm plantations. This has led to the accusation towards oil palm plantations as one of the main causes of forest and land fires in Indonesia. The fires had affected Indonesia and the surrounding countries in terms of haze resulting in health and transportation problems, and in terms of fauna and flora biodiversity destruction. The latest news from various national and local media reported that several oil palm plantations were still associated with the burning of land while clearing their areas, the destruction of high conservation value forests and pollution of rivers resulting from effluents from their mills.

In terms of the loss of HCVF, the expansion of oil palm plantations is suspected to primarily affect the ecosystems within and along riparian areas, fragment the habitat of endangered and threatened species, cause soil erosion, and marginalise local people whose lives are dependent on forest and its goods and services. The continuation of the life of orangutans, elephants, tigers and rhinos has often been reported as critically threatened due to this expansion.

The alleged negative implications of oil palm expansion and continuous campaigns to save tropical rainforests launched by NGOs have moved buyers, consumers and financiers in Europe that have links with the palm oil industry. As a result in 2000, ABN AMRO, Rabobank, and Fortis, three banks in The Netherlands – main financial supporters of the expansion of oil palm plantations – agreed not to support oil palm companies in Indonesia if the companies do not take into account environmental and social factors in their expansion plans. This move later on was followed by ING bank.

From buyers/retailers' side, MIGROS is an example of companies in Europe that has put policy in place to acquire palm oil products from sustainable sources. As one of the biggest supermarkets in Switzerland, MIGROS developed the criteria with the assistance from WWF-Switzerland. MIGROS' criteria consist of legal compliance, erosion prevention, environmentally responsible fertilising, and biodiversity and endangered species protection (Proforest, 2003).



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Negative implications of environmental and social issues on the palm oil industry have emerged and will magnify in the future if the industry does not start to improve both their practices and images. To face this global challenge, various palm oil actors from the whole chain of custody met and opened a dialogue with representatives from NGOs to develop a globally acceptable definition of sustainable palm oil production and use as well as implement better management practices that comply with this definition. The first comprehensive meeting took place in Kuala Lumpur in August 2003, well-known as the Roundtable on Sustainable Palm Oil (RSPO). One of important outcomes from the First Meeting of RSPO was the adoption of the Statement of Intent (Sol) which is a non-legally binding expression of support for the Roundtable and the production of sustainable palm oil.

## **Collaboration between IPOC and WWF-Indonesia**

As one of the leading representatives of the palm oil industry in Indonesia and a non-structural organisation under the Ministry of Agriculture, *Komisi Minyak Sawit Indonesia* (The Indonesian Palm Oil Commission or IPOC) saw the needs to deal with these sustainability issues directly and was willing to find appropriate solutions for the problems. The aim was to provide clear information, steps and guidelines, to its members (mostly industry players) and decision makers from the government, on the way to move forwards in implementing better management practices based on appropriate consideration of environmental and social aspects.

The first step taken was to conduct a study that identifies the interaction and impacts of oil palm plantations on the environment. This study or assessment intended to obtain clear and sufficient knowledge on environmental issues relating to oil palm plantations including the conversion of HCVF and the loss of wildlife habitat. The next step was to find and formulate 'best solutions' that combine both interests of business and the environment. This kind of solutions hopefully will positively change the practices and image of the Indonesian palm oil industry. In taking these two steps, IPOC reaches out WWF-Indonesia for collaboration and assistance. In April 2004, an MoU basing the collaboration between these two organisations was signed by Dr. Delima Azahari (Chief of IPOC) and Dr. Mubariq Ahmad (Executive Director of WWF-Indonesia).

## **The Assessment**

### **Objectives**

The overall objectives of this assessment were to acquire clear and sufficient data on the positive and negative impacts of oil palm plantations on forests and biodiversity in Indonesia and to find appropriate solutions of the problems. These solutions would act as a starting point in showing the responsibilities of Indonesian palm oil industry and changing the practices and image of the industry.

The specific objectives of this assessment were to identify and learn the impacts and interaction of oil palm plantations in Riau and West Kalimantan provinces on High Conservation Value Forest (HCVF) – inside and in the surrounding plantations – and to understand actions that have been or need to be taken to maintain or improve the quality of the HCVF. The findings would also be used to recommend any adjustments on existing sustainable palm oil criteria (including the one that is being developed by Proforest for RSPO).



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## Output

The output of this assessment was a report on comprehensive aspects incorporating the impacts and interaction of oil palm plantations on the environment, actions that have been taken to mitigate the impacts and recommendations for applying appropriate solutions in the future. Substances or findings from the report would be used for internal roundtable discussion of IPOC and to contribute to the 2<sup>nd</sup> International Roundtable Meeting (RT2) held in Indonesia this year.

## Methods and Activities

To fulfil the objectives, several phases of actions were conducted in this assessment as written below:

### 1. Formulation of criteria and questionnaires for the survey and study

To have a credible and agreeable set of criteria for this assessment and to understand complex interactions between oil palm plantations and the environment (including forested areas), IPOC requested the involvement of experts from various backgrounds (i.e. environment, forestry and plantations). After several preparation meetings, the expert panel for the assessment was established, involving experts from:

- The Centre for Area Establishment and Forest Conversion, Planning Department, the Ministry of Forestry
- The Centre for Mapping, Planning Department, the Ministry of Forestry,
- Directorate Area Conservation, Directorate General Forest Protection and Nature Conservation, the Ministry of Forestry,
- The Centre for Environmental Standardisation, Secretariate General of the Ministry of Forestry,
- Directorate for Plantation Development, Directorate General of Estate Crops Production, the Ministry of Agriculture,
- WWF-Indonesia,
- Indonesian Palm Oil Commission, and
- Plantation companies.

One important task of the panel was to formulate appropriated criteria for this assessment.

Prior to the RT2, there were various forms of criteria that are relevant to sustainable palm oil. Yet a comprehensive and widely acceptable set of criteria is to be developed and agreed. These existing criteria include criteria from:

- Draft Framework of Criteria for Sustainable Palm Oil (RSPO) developed by Proforest and to be discussed at the coming 2<sup>nd</sup> Roundtable Meeting,
- The International Federation of Organic Agriculture Movements (IFOAM),
- Sustainable Agriculture Network (SAN),
- Forest Stewardship Council (FSC),
- Euro-Retailer Produce Working Group Good Agricultural Practice (EUREPGAP),
- Migros Criteria for Oil Palm Plantations,
- Rabobank criteria for financing oil palm plantations,
- Dutch commercial banks (ABN AMRO Bank, Rabobank, ING Bank, Fortis bank),
- Unilever's Sustainable Palm Oil,
- Pacific Rim Palm Oil (PRPOL) Environmental and Social Handbook,



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- Environmental Guide for the Oil Palm Agro-industry Subsector (Ministry of Environment, Colombia)
- Guidelines on Classification of Plantation Companies, the Ministry of Agriculture of the Republic of Indonesia
- A set of relevant regulations issued by the Ministry of the Environment and the Ministry of Forestry.

For the purpose of this assessment, the panel of experts agreed to combine relevant aspects of the existing criteria (from international organisations and Indonesian government) to be used in the whole process of the assessment.

In principal, the panel of experts agreed that selected criteria used for assessment on plantations should incorporate aspects that ensure achievement of sustainability and mitigation of any environmental impacts. In other words, the palm oil industry should not conduct burning on forests and land for the purpose of land clearing, not clear cut old growth, primary and high conservation value forests, respect the rights and aspiration of local people, and respect both Indonesian and international laws.

In detail, the selected criteria for this assessment are shown in Box 1.

**Box 1. Criteria used for IPOC/WWF-Indonesia assessment of oil palm plantation**

1. Plantation management shall respect relevant Indonesian and international laws and regulations.
2. Plantation management shall cover the maintenance of *High Conservation Value Forests* (Type 1 – 6 according to *Forest Stewardship Council*) located inside and/or in the surrounding plantations. Conservation plan shall be implemented and monitored with a clear reporting system.
3. Biodiversity shall be conserved and maintained. Areas unsuitable for plantations shall be reforested.
4. Establishment or expansion of plantation shall not replace or destroy primary forests.
5. Land preparation for new established plantation or replanting shall not use burning methods. Existing plantations shall have system and organisation unit to prevent the occurrence of and the spreading out of forest and land fires.
6. Water resources, in terms of debit and quality, shall be protected.
7. Plantation shall prevent the occurrence of erosion by using appropriate national and/or international planting techniques.
8. Plantation shall ensure the sustainability of watershed areas.
9. Wastewater effluent shall be discharged according to government laws.
10. Pest and disease control inside plantation shall minimise the use of pesticides and optimally introduce biological methods as part of Integrated Pest Management (IPM).
11. The use of chemical substances and fertilisers shall be carefully planned considering the needs for environmental safety.
12. Rights of people (including indigenous people) shall be respected.
13. Plantation shall obey labour laws and regulation in Indonesia.
14. Plantation shall socially and economically benefit local people and Indonesia.

Based on these criteria, variables for survey were identified and developed. This then led to the formulations of guidelines for the survey as shown in Table 1.



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Table 1. Variables used for the survey.

Group	Sub-group	Variables*
I. Company	Respecting and obeying laws, regulations and relevant decrees	<ol style="list-style-type: none"> <li>1. Land</li> <li>2. Permits to establish plantation, company and mills</li> <li>3. EIA document</li> <li>4. Wastewater treatment</li> </ol>
	Existence of section to mitigate environmental problems	Existence of unit(s) that mitigates environmental problems
II. Management of HCVF	General	<ol style="list-style-type: none"> <li>1. HCVF identification</li> <li>2. Land suitability</li> <li>3. Land clearing</li> </ol>
	HCV 1	<ol style="list-style-type: none"> <li>1. Endangered and threatened species</li> <li>2. Elephant, tiger, rhinoceros home range</li> <li>3. Human wildlife conflict</li> </ol>
	HCV 2	<ol style="list-style-type: none"> <li>1. Forest landscape importance for the life of flora and fauna</li> <li>2. Corridor/connection between forested areas</li> </ol>
	HCV 3	Parts of plantation areas that are peat swamp and/or freshwater swamp
	HCV 4	<ol style="list-style-type: none"> <li>1. River and water sources important for communities' activities</li> <li>2. Water catchment area important to prevent from erosion</li> </ol>
	HCV 5	Forest as a source for communities' livelihoods
	HCV 6	Forest as a source for sustaining communities' culture
III. Social-economy	Community empowerment	<ol style="list-style-type: none"> <li>1. Entrepreneurship development</li> <li>2. Community economic institution development</li> <li>3. Transfer of knowledge and technology to communities</li> <li>4. Job opportunity for communities</li> </ol>
	Social activities	<ol style="list-style-type: none"> <li>1. Education</li> <li>2. Health</li> <li>3. Transportation</li> <li>4. Sport</li> </ol>

Based on this survey guideline, questionnaires were developed. The detail of questionnaires used for this assessment can be seen in Appendix 1.



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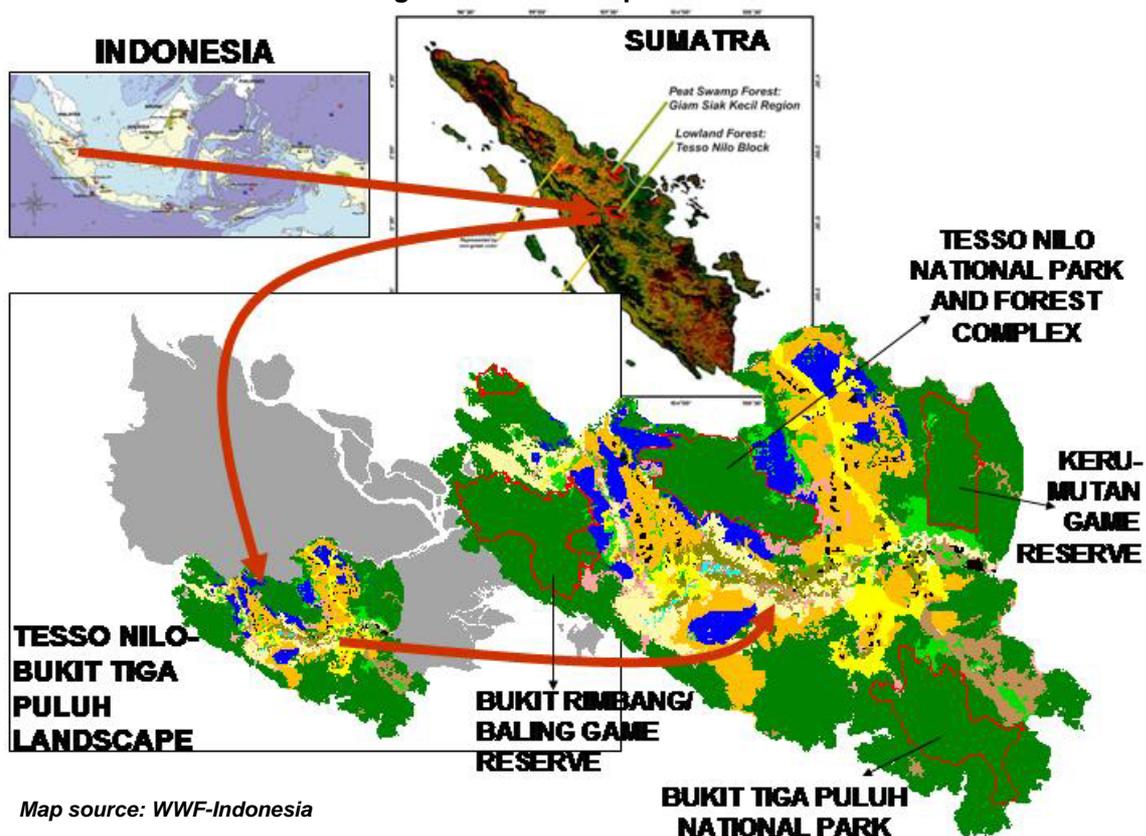
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## 2. Selection of locations for the study

The sites or locations for the study were selected based on significant interactions between oil palm plantations and High Conservation Value Forest (HCVFs) as indicated in a number of literatures (including from WWF, CIFOR or Centre for International Forestry Research and other NGOs). As a result, the panel of experts agreed to choose Tesso Nilo-Bukit Tiga Puluh Landscape in Riau Province and Kapuas Watershed in West Kalimantan Province as the working areas for the assessment. This consideration has led to the selection of several oil palm plantations in Riau and West Kalimantan as sample sites.

Tesso Nilo-Bukit Tigapuluh Landscape (Picture 1) covers four important conservation areas (considered as HCV/High Conservation Value 1), which are: Kerumutan Game Reserve, Bukit Tigapuluh National Park, Bukit Rimbang/Baling Game Reserve and Tesso Nilo National Park and Forest Complex. Within the Landscape, several big and small oil palm plantations exist and share boundaries with these conservation areas (Picture 2). For this reason, to understand the complex interactions between plantations and conservation areas becomes crucial. The Landscape and its conservation areas are one of the important remaining habitats for biodiversity including the endangered Sumatran tigers and elephants.

Picture 1. Tesso Nilo- Bukit Tiga Puluh Landscape



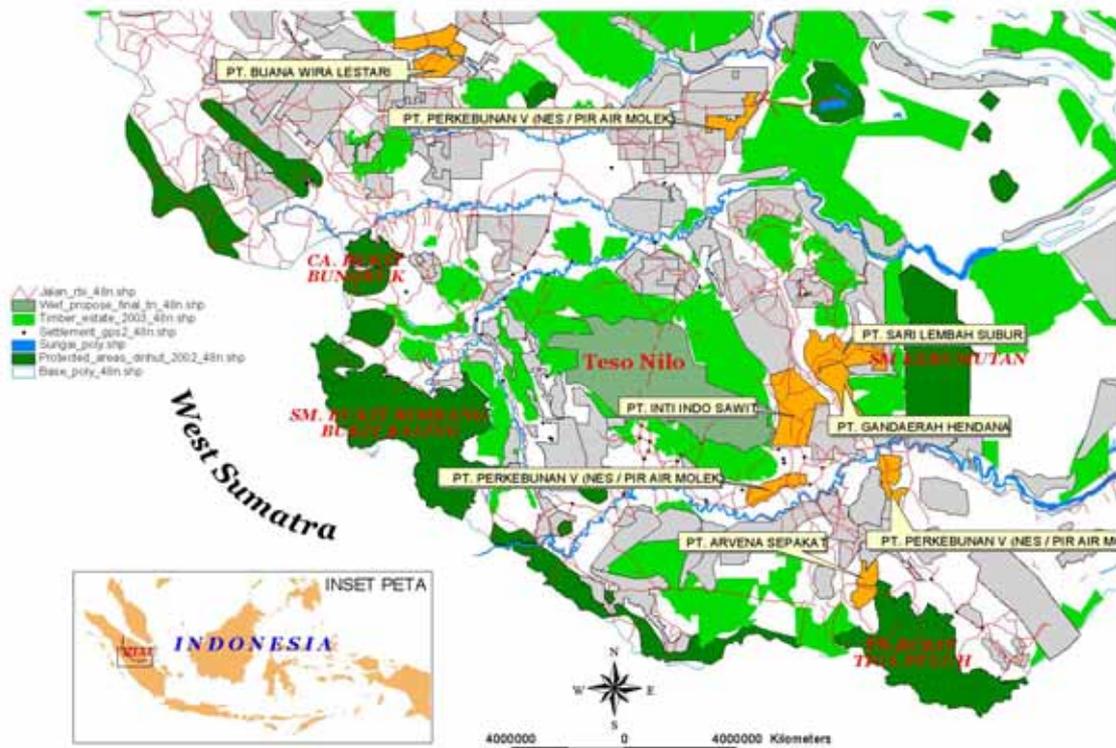


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Picture 2 shows several plantations within the Landscape that were selected as survey areas. One important aspect focused in the assessment in Riau was to find clear information on plantations-wildlife conflicts and possible link between the disturbance of wildlife areas and corridors to these conflicts.

**Picture 2. Selected oil palm plantations that were surveyed within the Tesso Nilo- Bukit Tiga Puluh Landscape**



Map source: WWF-Indonesia, IPOC, the Ministry of Forestry

In Kapuas Watershed in West Kalimantan Province, four important conservation areas exist. These are Betung Kerihun National Park, Bukit Baka Bukit Raya National Park, Danau Sentarum National Park, and Gunung Palung National Park. One key aspect focused in the assessment in West Kalimantan was to investigate an indication that oil palm companies opened important catchment areas such as in the surrounding Danau Sentarum NP. The findings from the assessment in West Kalimantan would hopefully contribute to efforts to achieve the sustainable watershed management in the province.

Picture 3 shows several plantations within the Watershed that were selected as survey areas. Table 2 lists all plantations incorporated in the assessment in both provinces.

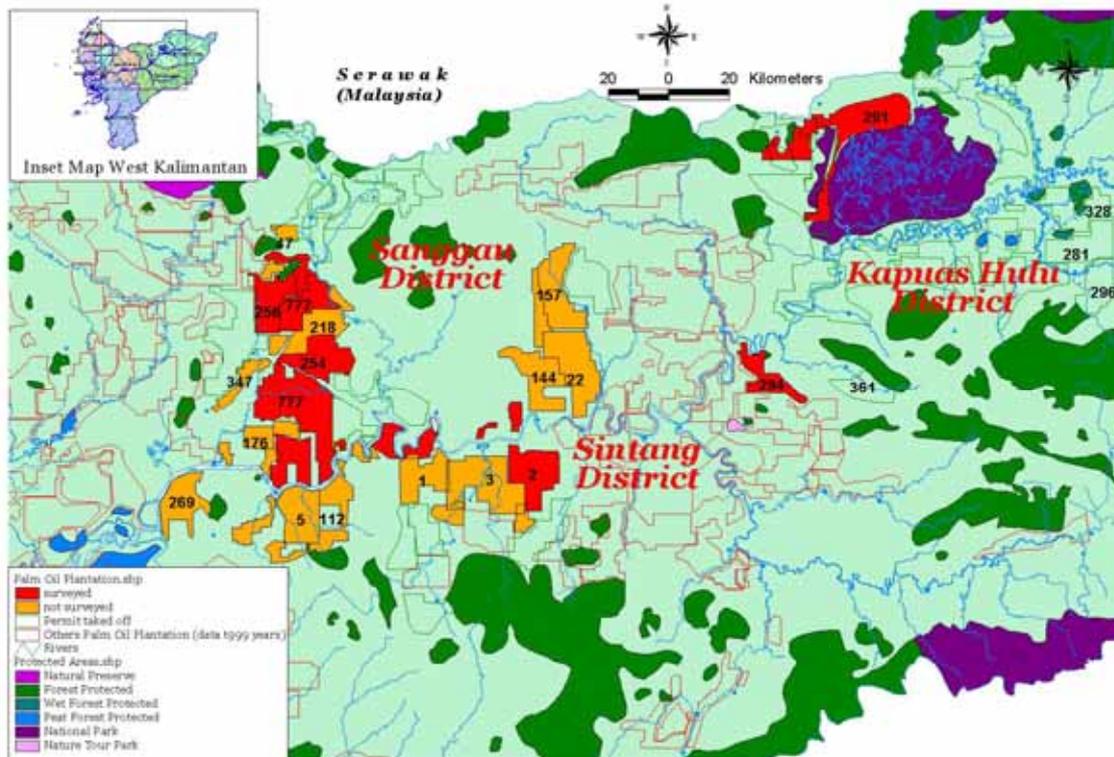


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Picture 3. Selected oil palm plantations that were surveyed (in red) within the Kapuas Watershed, West Kalimantan Province



Map source: WWF-Indonesia, IPOC, the Ministry of Forestry



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**Table 2. Oil palm plantations selected for the purpose of the study**

Plantations/Companies	Areas (ha)		Total (ha)	Province
	Nucleus	Plasma		
PT Buana Wira Lestari	12,579	8,000	20,579	Riau
PT Arvena Sepakat	1,150	-	1,150	Riau
PT Gandaerah Hendana	7,211	-	7,211	Riau
PT Inti Indosawit Subur	9,072	14,788	23,860	Riau
PT Sari Lembah Subur	7,106	8,000	15,106	Riau
PT Perkebunan Negara V, Air Molek	3,788	-	3,788	Riau
PT Perkebunan Negara XIII, Parindu	2,333	5,046	7,379	W.Kalimantan
PT Perkebunan Negara XIII, Ngabang	3,480	8,000	11,480	W.Kalimantan
PT Sime Indo Agro	4,054	4,268	8,322	W.Kalimantan
PT Multi Prima Entakai	2,200	8,800	11,000	W.Kalimantan
PT Kebun Ganda Prima	4,600	5,000	9,600	W.Kalimantan
PT Riau Agrotama Plantation	2 500	5,000	7,500	W.Kalimantan
PT Plantana Rezsindo	**	**	**	W.Kalimantan

\*\* Not active



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### 3. Implementation of the survey

To learn about the presence of HCVs inside and/or in the surrounding oil palm plantations, several activities were undertaken as follows:

- Flyover (aerial observation)
- Ground truthing (ground/field survey)
- Questionnaires distribution

#### Flyover (aerial observation)

Aerial observation was conducted to comprehensively view the Landscape of Tesso Nilo-Bukit Tigapuluh where ground survey could not cover. In this assessment, aerial observation was only conducted in Tesso Nilo-Bukit Tigapuluh Landscape.

#### Ground truthing (ground/field survey)

Ground survey was carried out inside and in the surrounding oil palm plantations that have been indicated to have one or several HCVs components. Ground survey was used to check the interactions between the plantations and HCVF. Decisions for ground survey areas also took into account information from local people, media, NGOs in the province.

In each survey sites, the survey team (involving representatives from IPOC, WWF-Indonesia, the Ministry of Agriculture, local governments and oil palm companies) collected data as follows:

- Geographical data collection using GPS (Geographical Positioning System) to ensure the coordinates of HCV location.
- Documentation using digital camera and video camcorder to compile examples of HCVs.

#### Questionnaires distribution

Interviews were conducted and questionnaires were distributed to plantation managers and staff and to communities living inside and in the surrounding plantations/ concessions.

To plantation managers and staff, questionnaires and interviews aimed at collecting information on:

- legality of plantations,
- presence of HCVs (HCV 1 to 6) inside and in the surrounding plantations and actions taken by plantations maintain these HCVs.
- IPM (integrated pest management) implementation, past actions on land clearing and plantation establishment, and a mechanism to manage oil palm waste/effluents.

To local communities, questionnaires and interviews aimed at cross-checking information on HCV 5 and 6 as well as information on the level of dependencies of communities on forest areas (socially and culturally).

Based on the findings of the survey, hence a report was written covering the aspects of the presence of HCV and gap analysis on HCV, threat analysis on HCV, and the recommendations for better maintenance and management of these HCVs.

The survey in 6 (six) oil palm plantations in Tesso Nilo-Bukit Tigapuluh Landscape was conducted on 5 to 9 May 2004, while in Kapuas Watershed on 23 to 27 June 2004.



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## Results

### Component 1 – Company (Legal and Environmental Unit)

The procedure to establish a new oil palm plantation in Indonesia is started with the issuance of the Letter from the Minister of Forestry on the Release of Forest Areas if the status of the land is forest. After obtaining the Letter or permit, a company needs to process a Letter of Principal Agreement on Plantation Activities from the Minister of Agriculture followed with the issuance of *Hak Guna Usaha* (HGU) from National Land Agency.

Other documents that are necessary include Environmental Impact Assessment (EIA) document and a permit to build palm oil mill from the Minister of Agriculture. The findings showed that almost all plantations have these documents

Based on questionnaires distribution and interviews, the origins of the land of the plantations were able to be identified. Mostly, plantations came from secondary forest areas (ex-HPH or logging concessionaires), shifting cultivation, illegal logging activities, and forest areas allocated for conversion (see Table 3).

**Table 3. The origins of plantations' land, classification of land suitability, methods in opening areas and establishing plantations in each plantation**

Plantations/Companies	Land Origins	Classification of Land Suitability	Land Clearing Methods
<b>Tesso Nilo-Bukit Tiga Puluh Landscape</b>			
Buana Wiralestari	Ex-HPH, Forest status: Production forest that can be converted	S1 (Significantly suitable)	
Inti Indosawit	Ex-HPH, Forest status: Production forest that can be converted		
Sari Lembah Subur	Ex-HPH, Forest status: Production forest that can be converted	S3 (Marginally suitable)	Land clearing activity through "stacking" method, where the left over logging left were accumulated on trail and left to be rotten, with 12 to 20 meter space between trails.
Gandaerah Hendana	Ex-HPH (Barito Pacific group)	S3 (Marginally suitable)	
PTPN V	Ex-rubber plantation, Forest status: Production forest that can be converted	S3 (Marginal suitable)	
Arvena Sepakat	Ex-HPH, Forest status: Production forest that can be converted	S3 (Marginal suitable) and N (Not suitable)	



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Plantations/Companies	Land Origins	Classification of Land Suitability	Land Clearing Methods
<b>Kapuas Watershed</b>			
PTPN 13 Parindu	Ex-shifting cultivation land and secondary forests (85%) and primary forests (15 %)	No data available from local management	Land clearing activity through "stacking" method, where the left over logging left were accumulated on trail and left to be rotten. Grasses were cleaned using chemical substance such as round up.
PTPN 13 Ngabang	Ex secondary forests and small parts of primary forests (50%) and ex-shifting cultivation land (50%)		
PT. Multi Prima Entakai	Ex-illegal logging areas		
PT. Sime Indo Agro	Ex-shifting cultivation land (80%) and secondary forests (20%)		
PT. Kebun Ganda Prima	Ex-shifting cultivation land		
PT. Riau Agrotama Plantation	Ex-transmigration areas		
PT. Plantana Reszindo	Not operating anymore		

## Component 2 – HCV Management (Aggregated)

### 1. Tesso Nilo-Bukit Tiga Puluh Landscape

#### General

From interviews, the survey team found that all plantation companies have not understood HCVF concepts and have not carried out any identification of HCVF inside their concessions. This hence led to activities that may result in negative impacts on the environment. These include river banks that were not conserved/restored, planting on peat lands that have more than 3 m depth, land clearing in important catchment areas, leaving opened areas for relatively long period, planting oil palm on river banks, planting oil palm on steep slope and land clearing on important biological/wildlife corridors.

Nevertheless, a number of plantations have applied necessary actions that related to maintenance of HCVs and environmental management. These include putting electrical fences and building canals as a buffer to avoid disturbances from elephants, conservation of forested areas used by local indigenous people, conservation in riparian areas, using zero burning methods for land clearing, implementing IPM, and using cover crops. The general observation on the interaction between HCVF and oil palm plantations can be seen in Table 4.



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**Table 4. Finding results on the interaction between plantations and components of HCVs inside Tesso Nilo-Bukit Tiga Puluh Landscape**

HCV (or HCV element)	Finding Results
<b>HCV 1</b> Forest areas containing globally, regionally or nationally significant concentrations of biodiversity values (e.g. endemism, endangered species, refugia)	
<b>HCV1.1</b> <i>Protected Areas</i>	<b>Tesso Nilo NP, Bukit Tiga Puluh NP</b>
<b>HCV1.2</b> <i>Threatened and Endangered Species</i>	<b>Tigers*, Elephants,</b>
<b>HCV1.3</b> <i>Concentration of Endemic Species</i>	<b>Tigers, Elephants</b>
<b>HCV1.4</b> <i>Critical temporal use</i>	<b>Elephants</b>
<b>HCV 2</b> Forest areas containing globally, regionally, or nationally significant large landscape level forests, contained within, or containing the management unit (MU), where viable populations of most if not all naturally occurring species exist in natural patterns or distribution and abundance.	
<b>HCV2.1</b> <i>Management unit (MU) is a large level landscape forest</i>	
<b>HCV2.2</b> <i>Management unit (UD) is an integral part of a large level landscape forest</i>	
<b>HCV2.3</b> <i>Management unit (UD) maintains viable populations of most naturally occurring species</i>	
<b>HCV 3.</b> Forest areas that are in or contain rare, threatened or endangered ecosystems. (No additional elements)	<b>Peat land &gt; 3 m</b>
<b>HCV 4.</b> Forest areas that provide basic services of nature in critical situations (e.g. watershed protection, erosion control).	
<b>HCV4.1</b> <i>Unique sources of water for daily use</i>	
<b>HCV4.2</b> <i>Forests critical to water catchments and erosion controls</i>	
<b>HCV4.3</b> <i>Forests providing barriers to spread of fire</i>	
<b>HCV4.4</b> <i>Forests with critical impact on agriculture and aquaculture</i>	
<b>HCV 5.</b> Forest areas fundamental to meeting basic needs of local communities (e.g. subsistence, health) (No additional elements)	
<b>HCV 6.</b> Forest areas critical to local communities' traditional cultural identity (areas of cultural, ecological, economic or religious significance in cooperation with such local communities) (No additional elements)	<b>Taboo Forests (culture belief)</b>

The findings in table 4 were obtained from direct observation/ground survey, answers from the questionnaires and information from local people.



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#### Components of HCV 1

HCV 1 is forest areas containing globally, regionally or nationally significant concentrations of biodiversity values (e.g. endemism, endangered species, refugia). In detail, HCV 1 can be described as follows:

- HCV 1.1. Protected areas
- HCV 1.2. Threatened and endangered species
- HCV 1.3. Concentration of endemic species
- HCV 1.4. Critical temporal concentrations

#### HCV 1.1.

In Tesso Nilo-Bukit Tigapuluh Landscape, there are three protected areas that have strong legal status which are Kerumutan Game Reserve, Bukit Rimbang/Baling Game Reserve and Bukit Tigapuluh National Park. These three protected areas automatically were considered as a component under HCV 1.1 (actual presence). In the case of Tesso Nilo forest complex, only ±38,576 ha out of 120,000 ha that have been gazetted as national park based on Decree of the Minister of Forestry Nr. 255/Menhut-II/2004. This new NP was also considered as HCV 1.1. component.

Interactions between plantations and this HCV component found during the assessment period are described below:

- Poor management of plantations in acknowledging the components of HCV 1.1. has resulted in more opened areas in the boundaries of protected areas that might lead to further conversion of and threats to these important forests.
- Plantations' infrastructure (i.e. roads) has often been used by outside people as a short cut to reach protected areas to do illegal activities such as illegal logging and poaching. If there are no actions taken to control this, the consequences will be serious especially for the existence of biodiversity in the Landscape.
- There is a need to secure the connections (biological/wildlife corridors) between fragmented protected forests. Actions that can be taken are support from oil palm companies in conserving or restoring forests in the corridors and commitment to halt forest conversion in these respected areas. A few plantations have actually implemented a good start by putting fences in the boundaries of protected areas' buffer zones. Yet this action was not sufficient without the securing of forest/biological corridors.

#### HCV 1.2.

Habitat for most species considered under HCV 1.2. in the Landscape has been constantly under threats. This was due to illegal logging activities and the use of plantations and forest concessions access located near protected and forested areas for other illegal activities.

As a result, it was proven from the survey that most plantations' concessions located near protected areas and forests have been facing conflicts with big mammals that have wide home range such as elephants and tigers. These two species are protected by law. To deal with this appropriately, one and two plantations have put canals and electric fences to avoid the disturbances from elephants. However, these efforts are not adequate and companies with other stakeholders need to find longer-term solutions at landscape level such as conserving wildlife habitat and corridors.

#### HCV 1.3.

Endemic species found in the Landscape include Sumatran elephants (*Elephas maximus sumatranus*) and Sumatran tigers (*Panthera tigris*), as well as Bushy-crested hornbills (*Anorrhinus galeritus*) that were



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found only in Kerumutan Game Reserve. However, only elephants and tiger that face serious conflicts with oil palm plantations. WWF-Indonesia has extensively studied the conflicts involving plantations and elephants and tigers. IPOC and a number of plantations have agreed to find best solutions for the problems.

#### Components of HCV 2

HCV 2 is defined as forest areas containing globally, regionally, or nationally significant large landscape level forests, contained within, or containing the management unit (MU), where viable populations of most if not all naturally occurring species exist in natural patterns or distribution and abundance. Based on the topography of the southern part of Riau Province where the Landscape is located, areas considered under HCV 2 were hilly areas. In these hilly areas, primary forests were presence in relatively large areas. It is suggested that the government should not issues any more permits to open these areas for plantation establishment or non-forest uses.

#### Components of HCV 3

Analysis on land suitability showed that several companies still planted oil palm in areas which were not suitable for oil palm plantations. For instance, according to the Decree of the Minister of Forestry and Plantations Number 376/Kpts-II/1998 about Criteria of Provision of Forest Areas for Oil Palm Plantations, in point 2, land that is suitable for oil palm plantations is the one that contents only peat swamp lesser than 2 m (depth). However the survey still found plantations that opened peat swamp more than 2 m (depth). Degradation of peat swamp forests or areas will likely to have direct or indirect impacts on the nearest protected areas such as suffering from drainage. In addition, this disturbance will make the areas prone to the occurrence of fires.

#### Components of HCV 4

HCV 4 components often found or closely interacting with plantations were component 4.1 (related to water needed by surrounding local people) and 4.2 (related to cathcment areas). Geographically, the Landscape is situated between two huge rivers, Indragiri and Kampar. All plantations surveyed in this assessment have one way or another in terms of the interaction with these rivers. Even inside plantations, sub-rivers with 0.5 to 10 m width were commonly found.

In any EIA documents, efforts to maintain conservation values of riparian areas usually have been articulated. Conservation of riparian areas is necessary to maintain and enhance the debit and quality of freshwater needed by local people. However, the survey team found that almost all oil palm plantations disregard the importance of riparian areas protection. Some companies still planted oil palm on river banks. The rest has managed to begin a good effort by putting structured water management in place with good schemes of canals inside the plantations. The combination of good maintenance of built canal and conservation of riparian areas needs to be a future norm for oil palm companies.

Rivers running through plantation areas can be considered under HCV 4.1. due to the fact that water from the rivers was used by local people. Plantation activities such as fertilisation, the use of pesticides and wastewater discharge will affect the quality of water in these rivers. Data collected during the survey show the majority of oil palm plantations has implemented the use of IPM to reduce the use of pesticides while wastewater and solid water from plantations and mills were treated with land application techniques. The use of IPM and land application needs to be improved and strengthened with the combination of conservation of riparian areas.



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Another important component relevant to HCV 4 is conservation of steep slope areas (> 45%). Based on Decree of the Minister of Forestry and Plantations Number 376/Kpts-II/1998 about Criteria of Provision of Forest Areas for Oil Palm Plantations, in point 2, land that is suitable for oil palm plantations is the one that has slope between 0 and 25%. Based on the survey, a number of companies were found to still plant oil palm in areas having slope more than 30 %. This was worsened by the fact that the areas usually were left opened. This may eventually cause soil erosion. Therefore, the conservation of these areas is necessary.

#### Components of HCV 5

HCV 5 components are forest areas fundamental to meeting basic needs of local communities (e.g. subsistence, health). From the survey it was found that quite a number of companies has set aside or left untouched forested areas inside concessions that were important and used by local people. Although not huge in terms of hectares, this is considered as a good signal from the palm oil industry and therefore needs to be magnified in other areas.

#### Components of HCV 6

The survey team found that in two plantations there were forested areas kept because of their importance for local people's culture (i.e. taboo and ancestral forests). In several sites, components of HCV 6 often overlapped with HCV 5 (e.g. ancestral forests which were also important for local people's livelihood). Furthermore in one plantation, HCV 6 overlapped with HCV 2. This is shown by the fact that an ancestral forest was respected because the forest was considered as an important habitat for Sumatran tigers.

## **2. Kapuas Hulu Watershed**

### HCV 1.1.

In the Watershed, there exist four important protected areas naming Betung Kerihun National Park, Bukit Batutenobang, Bukit Baka National Park and Danau Sentarum National Park. These protected areas have an important function as catchment area in Watershed. The health of the protected areas will contribute to the stabilisation of water debit of Kapuas River. At the same time, the protected areas were a core home to various species and other types of biodiversity.

Specific to Danau Sentarum area, the survey found an overlapping concession of one plantation with the buffer zone of the national park. The survey team also gathered information about the cancellation of permits of seven companies operating in the surrounding Danau Sentarum. The companies were alleged to have misused the permits to establish oil palm plantations. The government believed that these companies just wanted to collect timbers from the areas rather than establishing oil palm plantations.

Danau Sentarum was also threatened by various types of illegal logging using road access developed inside oil palm and logging concessions. These roads may contribute to the decrease in conservation values of this protected area located in the upper stream of Kapuas Watershed.

### HCV 1.2

Habitats of species considered under HCV 1.2. were threatened by illegal logging activities and forest fragmentation resulting from forest conversion. In addition, due to the decrease in forest cover in West Kalimantan, dayak people had difficulty in collecting species used for their consumption (e.g. wild boar).



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Some of them now found substitutions in orang-utan and other mammals. Consequently, this has contributed to the decrease in a number of orang-utan.

#### HCV 1.3

No endemic species found in the surveyed areas. However at the upper stream areas of Watershed level, some endemic species live, such as: *Arwana (Sclerophages formosus)* and the famous Helmeted hornbill (*Rhinoplax vigil*) – used as a mascot for West Kalimantan Province. The life of endemic species will depend on the efforts to save and sustain forested areas in the upper catchment of the Watershed.

#### Components of HCV 2.

Most oil palm concessions had boundaries or overlapped with parts of a large level of landscape forests. Some parts of these forests have been enclaved by the plantations. However, not a single plantation has conducted a study about biodiversity inside these forests. Yet policies to still leave the forests untouched have help the maintenance of the components of this HCV 2. One thing that is needed to be done by the plantations is making sure that their road access is protected from the use by illegal loggers.

#### Components of HCV 4

Almost all oil palm concessions surveyed in this assessment had rivers (huge and small) running through the concessions. No matter small a river, conservation efforts are still needed to ensure the health and quality of the freshwater. Most rivers running through oil palm concessions were important parts of people's every day lives.

Kapuas River is the main river in Kapuas Watershed. The River runs through from the east to Java sea in the west. Kapuas Watershed can be classified into three riparian systems. First is Kapuas River Upper System that is important to control the Watershed from flooding and erosion. The first system contains ecosystems of montane forests, peat swamp forests and some parts of lowland forests.

In this first system, Danau Sentarum NP functions as natural reservoir for ensuring the sustainability of freshwater flow in the Watershed. The core and buffer zones of this national park is therefore needed to be protected. Opening the areas of the buffer zone of the national for oil palm plantations will not serve good purposes for the Watershed.

The second is Kapuas River Middle System containing forests with muddy sandstones that are needed to be protected from deforestation. If deforestation occurs, the erosion from the top soil will have enormous impacts on people and the ecosystems in the downstream areas.

The third is Kapuas River Lower System. This system covers lowland forests and swamp forests up to coastal areas. Population density is relatively high. Development in this area should be carried out carefully and cautiously because this can affect a large number of people such as the decrease in quality and quantity of water source for these people.

Oil palm plantations mostly were located in the second system (middle part). An integrated mechanism needs to be developed incorporating plantations, local governments and local NGOs to ensure the conservation of riparian areas.

Other findings showed that the riparian systems in the Watershed have been seriously threatened by pollution coming from illegal mining activities (the use of mercury) and illegal fishing (the use of cyanide).



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#### Components of HCV 5

From the survey, it was found that there were two forested areas considered important for the livelihoods of local people in two plantations. The benefits obtained by local people from these forests were various types of animal species that can be consumed, the collection of non-timber forest products such as rattan, and traditional medicines from forest plants. Conversion in this type of forests will significantly affect the livelihoods of local people.

#### Components of HCV 6

During the survey, the team found two forest areas set aside by companies due to their importance for local cultural beliefs. In one area, a traditional dayak long house was the reason for a plantation company to leave the forest in the area intact. In another area, animal cemetery was the basis for a plantation company to set aside less than 1 ha of this forested area.

### **Component 3 – Social Economy**

#### **1. Community empowerment**

Community empowerment in the palm oil industry is defined as any efforts from plantation companies to help the improvement of the quality of local people's economy. The efforts include any economic activities relevant to local people.

From the survey it was found that almost all plantations had systems to assist small farmers/planters for the improvement of oil palm production using such as systems of nucleus-plasma (PIR) and planting oil palm on community lands (KKPA) – see Table 2. However not all communities can be included in these systems of PIR and KKPA.

For the future, transfer of technology and management especially good agricultural practices need to be continued and improved from plantations' side to communities. Plantations need also to find appropriate solutions that can absorb the involvement of wider communities in the activities of palm oil production. Good social relations strengthened with economic relations may be appropriate systems to be adopted by a plantation in its engagement with local communities.

#### **2. Social activities**

All plantations have one way or another undertaken social activities. Several plantations even provided infrastructure and education, health and sport facilities for their workers and local people. Overall, this type of provision needs to be maintained and improved to show the benefits of plantations to local people.

Social activities inside plantations and with surrounding communities actually have good implications for plantation companies such as reducing social costs by avoiding unnecessary conflicts. Nowadays, conflicts between plantations and local people have often been heard in many areas. This happened probably because local people have not obtained any benefits with the presence of oil palm plantations. Tensions between two parties could also rise as a result of river pollution from poor managed palm oil mills.

In the future, management and mechanism to solve these conflicts should be adopted by plantations. This is also discussed in the draft criteria on sustainable palm oil developed by Proforest.



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#### Conclusions and Recommendations

Many things have been discovered during the survey and assessment period. Key findings can be grouped in to three aspects, which are:

1. All plantations have implemented some parts of good environmental management such as IPM, land application and waste management. In plantations that belong to big groups, these types of environmental management have been incorporated in their policy papers and put into practices.
2. Unfortunately all plantations surveyed in this assessment have not understood HCVF concepts and criteria. The plantations have yet to realise important links or interactions between plantations' concessions and the surrounding HCVFs. As a result, disturbances and threats to the surrounding high conservation areas were still prevalent. These were shown by the occurrence of illegal logging activities using access of plantations' roads, overlapping zoning between concessions and HCV areas, and the ongoing conflicts between plantations and wildlife.

In the case of Tesso Nilo-Bukit Tiga Puluh Landscape, the plantations have yet to understand the importance of protection or restoration of wildlife habitats and corridors. In Kapuas Watershed, the plantations have yet to learn about the implications of their activities on Kapuas river system.

Nevertheless, a few plantations have put efforts to ensure some sorts of protection or conservation of important areas such as river banks and forests important for local people.

3. There were some sorts of social relation programs or activities carried out by plantations. These include implementation of a system of nucleus-plasma relation in planting oil palm and provision of infrastructure and health, education and sport facilities for plantation workers and local communities.

However, the social programs of these plantations have not intensively focused on solving existing of possible crucial conflicts with communities on the issues of land tenure and environmental pollution.

With three key findings, the assessment also results in three major recommendations as follows:

1. Due to the fact that all plantations have not understood HCVF and wider sustainable palm oil concepts and criteria, efforts to socialise, transfer the knowledge and build capacity on these aspects are therefore needed. Response from the palm oil industry on this recommendation has been positive until now. This was shown by the organising of the first 'Training (scheduled for three more) on Sustainable Palm Oil/HCVF' on 13 August 2004 at Grand Hyatt Hotel in Jakarta.

The training was attended by more than 60 people from the level of CEOs (chief of executives) of big oil palm companies, representatives from plantation' associations, plantation managers, smallholders association, banks and government officials. The training was led by Proforest, facilitated by RSPO, IPOC and WWF-Indonesia, and supported by the Royal Netherlands Embassy Office of Agriculture, Nature and Food Quality and Stichting DOEN. The three planned trainings are scheduled to be carried out in Medan, Pekanbaru and Balikpapan.

A similar activity to socialise sustainable palm oil was also carried out by IPOC and GAPKI (Indonesian Oil Palm Producers Association), named as 'National Roundtable on Sustainable Palm Oil' in September 2004. This roundtable focused on the discussion of draft criteria on sustainable palm oil developed by



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Proforest. To have inputs from stakeholders outside the palm oil industry, IPOC and GAPKI invited WWF-Indonesia and Sawit Watch to enrich the discussion. The output of this roundtable is recommendations from Indonesian palm oil industry to the criteria developed in RSPO.

2. Although a few plantations have implemented activities to protect or conserve of important areas such as river banks and forests important for local people, further efforts to maintain and enhance conservation values inside plantations and at the landscape level are crucial. The management should incorporate HCVF concepts as integrated parts of its environmental and operational plantation management. Plantation companies are required to identify and assess possible impacts of their operations on the environment including existing and potential high conservation values inside and outside their concessions.

At operational level, plantation companies need to improve their efforts in conserving river banks and riparian areas, blocking the access for people to do illegal logging or poaching, restoring the functions of areas not suitable for oil palm, and ensuring the protection or restoration of wildlife corridors. In the case of Bukit Tiga Puluh-Tesso Nilo Landscape, plantations need to support efforts to save wildlife habitats and corridors such as forested areas between Bukit Rimbang/Baling Game Reserve and Bukit Tiga Puluh National Park. In Kapuas Watershed, plantations need to support efforts to well-managed integrated watershed management through the conservation of riparian areas and the buffer zone of Danau Sentarum National Park.

3. The existing social programs need to be maintained but all plantations need to improve and strengthen their programs especially by establishing a management or mechanism to solve conflicts with local communities. The conflict resolution management or mechanisms will allow plantations to bridge communication gaps with communities and understand basic problems. Opening dialogues with NGOs working in social and community aspects need to be started by oil palm companies so that clear views on the problems can be obtained.



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## Appendix 1

### Questionnaires

#### I. Legal aspect of a company

##### *Obliged to laws and regulations*

1. Does your company have SK Pelepasan Kawasan Hutan (Decision Letter for Releasing Forest Areas) from the Minister of Forestry?

If yes,

Decision Letter number (SK) :

Date issued :

Location :

2. Does your company have licence?

If yes, answer these following questions and fill in the table below.

Licence number :

Date issued :

Issued by :

Plantation(s)	Nucleus/Plasma	Area (ha)	Location (Prov./Dist./Sub-d.)

3. Explain the origin of your plantation.

Plantation(s)	Area (ha)	The origins of land

\* Was your land originally established from primary forest, protection forest, production forest, conversion forest, ex-shifting cultivation, ex-HPH (logging concessionaires), ex-illegal logging areas, ex-forest fires, or else?

4. Does your plantation have a mill? If yes, answer these following questions.

- Registration number for the permit :
- Date issued :
- Issued by :
- Capacity of the mill(s) :
- Facility for waste treatment :
- BOD/COD of the latest effluent :
- The use(s) of waste effluent from the plantation:

5. Has your plantation company's establishment equipped with EIA (environmental impact assessment) document.

If yes:

a. EIA document number :

b. Date approved :

c. Approved by :

d. EIA done by :



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#### Institution in mitigating environmental impacts

6. Has the organisational structure of your company accommodate a unit to mitigate environmental impacts such as forest/land fire fighting? If yes, please answer these questions below.
- Please write the name of the unit.
  - Explain the roles and functions of the unit.  
Does the unit have the method to prevent fires from happening and expanding inside the plantation/ please explain?

#### II. Management of high conservation value forests

##### General

7. Has your company conducted HCV identification inside and in the surrounding area of your plantation? If yes, please fill in the table below.

Types of HCVs	Location	Actions taken

8. Does your plantation have a piece of land that is not suitable for oil palm and/or need to be conserved/protected/restored? Please fill in the table below.

Location (plantation, block)	Reasons why considered not suitable	Area (ha)	Actions taken in the respective land.

9. In land clearing process, what kind of methods did your company use (mechanical, chemical or fire methods)?
10. Has your company applied the system of Integrated Pest Management (IPM) in controlling pest and diseases? If yes, explain the method used.
11. Has your company applied fertilising system based on recommendations from acknowledged institution(s)? If yes, write the name of the institution.

##### HCV 1

12. Does your plantation cover concentration of endangered and/or threatened species population? If yes, please fill in the table below.

Species	Species location inside plantation	Actions taken to protect the species



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13. Is your plantation considered in the home range of important wildlife such as tigers, elephants or others? If yes, please fill in the table below.

Species/ wildlife	Location of plantation that overlaps with elephant/wildlife homerange	Number of conflicts with human or plantation documented	Efforts to protect

### HCV 2

14. Is your plantation inseparable part of large level forest landscape? If yes, please answer these questions below.
- Is your plantation located at the buffer zone of forest?
  - Does your plantation have a method to prevent and fight the spread out of forest/land fire?
  - Has your plantation with its road system resulted in forest fragmentation? If yes, has the company tried to overcome the problem for instance by maintaining the corridor connecting two separate forest areas?
  - Is your plantation included in the system of particular watershed area/riparian area (*daerah aliran sungai/DAS*)? If yes, has there been any action taken by the company to strengthen the function of the watershed?
15. Is there any endemic wildlife living inside the concession of your plantation? If yes, please answer these questions below.
- Please name the species.
  - Please explain the efforts taken by the company to protect the species.

### HCV 3

16. Is your plantation located inside or in the border of forest protection? If yes, please answer these questions below.
- What are reasons for stating the area as forest protection?
  - If your plantation is located inside forest protection, do you know any reasons for this?
  - Have roads built by the company resulted in the increase in the level of erosion in forest protection area?
  - Have roads built by the company resulted in the access of community to utilise forest protection?
  - What kind of efforts your company has taken to ensure the protection of the forest protection?



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17. Are there any peat swamp forest/areas or freshwater areas located inside your plantation? If yes, please fill in the table below.

Type of swamp areas	Depth of the areas	What kind of species/wildlife use swamp as habitat?	Efforts taken by the company

#### HCV 4

18. Is there any water source (spring water etc..) inside your plantation that is used by communities for daily activities? If yes, what kind of efforts the company has done to maintain the quality and debit of the water?
19. Is there any river runs through your plantation? If yes, please answer these questions below
- Please explain a method your plantation has chosen in planting oil palm in the respective river banks.
  - Is the river is similar location for your company to discharge effluent from your mill? If yes, what is the level of BOD/COD of the effluent?
  - Is the water of the river an important source for local community livelihoods? If yes, what is the water used for?

#### HCV 5

20. Is there any forest area in the surrounding of your plantation use for daily activities and livelihood source of local community (source of food, for building materials, medicines, etc.)? If yes, what kind of actions taken by the company to ensure the protection of the forest?

#### HCV 6

21. Are there any forest areas inside or in the concession of your plantations that are important for the sustainability of local/indigenous people's culture (e.g. suku anak dalam, etc.)? If yes, please answer these questions below.
- Has the company tried to ensure the protection of local/indigenous people's interest and culture?
  - Is there any company's policy that has resulted in the marginalisation of local/indigenous people dramatically?



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### III. Social economy

#### Social aspects

22. Has the company built any health facility and improved the level of surrounding community's health? If yes, please explain your company's program (e.g. polyclinic or community health centre, access for local community to company's health centre).
23. Has there been any specific action taken by company to build educational facility or improve the level of community's education? If yes, please explain your company's program (e.g. elementary school development, provision of teachers, scholarship, etc.).
24. Did your company specifically build religious houses or improve the quality of these existing houses? If yes, please explain your company's program (e.g. relating to development of mosque or church, etc.).
25. Does your company have a specific program in building public roads or improve the quality of existing roads? If yes, please explain the program.
26. Does your company have a program to support sport facilities of local community? If yes, please explain the program.

#### Community empowerment

27. Has your company been involved in supporting local economic activities? If yes, please explain your company's program (type of business and the method to facilitate local community's business activity).
28. Has your company been involved in strengthening the institution of local community's economy? If yes, please explain your company's program.
29. Is there any increase in the level of income of local people after your plantation established? If yes, how much the level of income of local people before and after the plantation established?
30. Does your company provide facilities/infrastructure for local production activities? If yes, please explain the program (seedling, technology, etc.).
31. Does your company have any partnership with local planters/small holders? If yes, please answer these questions below.
  - a. Does your company have any partnership with a big-scale company?
  - b. Does your company have any plasma? If yes, please provide the starting date the plasma was facilitated (date/month/year). If the plasma has been released, please provide the date (date/month/year) of the release of the plasma and please provide explanation on the relationship of your company and the plasma.
  - c. Does your company have any partnership with local plantation through other systems beside PIR (*perkebunan inti rakyat* – people nucleus plantation)? If yes, please explain the system of partnership.
32. To describe the economic impacts of your company/plantation on national and local economy, please answer these questions below.
  - Please describe your company's contribution to national and local economy such as decreasing unemployment rate at the national level and providing jobs for local community.
  - Please describe your company's contribution to local economy especially in directly or indirectly increasing the level of local economic growth.



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## Appendix 2

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