The Forest Carbon Partnership Facility (FCPF)
Readiness Plan Idea Note (R-PIN)

February 16, 2009

There is a strange paradox in the international community. Everyone sings our praise for having managed to retain our forests and there is increasing pressure on us to conserve even more of our territory and to refrain from economic activities that threaten or harm our forests. Yet, there does not seem to be any means available to help us invest in developing a sustainable economy for the benefit of our own people, while retaining the important function as lungs of the world. The global panic about the effects of climate change is not translated into comparable international efforts to provide the resources to support rainforest nations. It is, therefore, time and no more than fair, that a global payment system be devised to compensate us, forested countries, for the ecological services being provided to the international community by the forests we have so prudently maintained throughout the years.

Suriname has the highest forest cover percentage in South America, and its historically low deforestation rate is not an accurate predictor of the near term future deforestation rate. Suriname believes that all national circumstances must be considered in a long-term cooperative agreement on climate change, particularly over the next 50 years when avoiding dangerous climate change is most critical. Suriname's environmental services are provided to all countries and this must be recognized and fairly compensated. Suriname's REDD Readiness programs will work to identify development factors that can be used to adjust national reference scenarios. Also, Suriname's neighboring countries are rapidly pursuing extensive REDD programs, and if Suriname's REDD Readiness is not pursued at this same accelerated pace, then regional displacement may become a material threat to Suriname's forests. Suriname intends to work with other countries, especially those also supported by the World Bank FCPF, that possess low historical emissions, and to develop a set of common recommendations especially leading up to COP-15 in Copenhagen. The World Bank FCPF is uniquely positioned to catalyze Suriname's REDD Readiness, and to assist Suriname with these goals that complement the FCPF vision of the partnership.

Country submitting the R-PIN: Republic of Suriname
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1. General description:

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The Minister of Physical Planning, Land and Forest Management (RGB) is the focal point for FCPF.
Stichting voor Bosbeheer en Bostoezicht (SBB - Foundation for Forest Management and Production Control) is the organization responsible for sustainable management of the Surinamese forests, and in particular the production forests. SBB is also the focal point for UNFF.

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c) Who was consulted in the process of R-PIN preparation, and their affiliation?
The Presidential Task Force involved in the preparation of the UNFF/Country Led Initiative meeting on Financial Mechanisms for Sustainable Forest Management in Paramaribo (Sep. 2008) initiated the preparation of the R-Pin. GoS staff and technicians (Ministries of Physical Planning, Land and Forest Management; Labor, Technological Development and Environment; Foreign Affairs) as well as the Foundation for Forest Management and Production Control (SBB) were consulted, and helped to prepare the initial draft. In the following cycle, a wider group of technicians and experts, as well as representatives of national and international non-government organizations, shared information, discussed and updated the draft document. Although the GoS desired more dialogue with civil society and the private sector, Indigenous and Maroon peoples, time and resources did not permit such wide consultations. The authors did use resource materials which were developed and written through wide consultation processes with national platforms and participatory processes, which involved representatives of the GoS, international and national NGOs, indigenous and maroon peoples, and the private sector (e.g. the forest sector policy, the biodiversity strategy document, the CSNR management plan). Dialogue with wider circles of relevant stakeholders, including representatives of the Maroon and Indigenous peoples, will take place in the next phases, i.e. during project preparation, implementation, monitoring and evaluation.

2. Which institutions are responsible in your country for:
a) forest monitoring and forest inventories:
Virtually all forested land in Suriname is officially owned by the Government, who can grant permits and concessions for timber harvesting, mining, and so forth, but retains ownership. In virtue of the 1947 *Instellingsbesluit* and the 1992 Forest Management Act, the Forest Service (LBB) of the Ministry of Physical Planning, Land and Forest Management is officially in charge of the management of all forests in the widest sense of the word, with the specific task of "sustainable management of the forests for the benefit of the nation".
The SBB (Foundation for Forest Management and Production Control) was established in 1998 with financial and technical assistance from the Dutch Government and UN FAO to fulfill the mandates of the Forest Service to carry out forest monitoring and forest inventories and produce production statistics. Various forest monitoring efforts have been undertaken since 1967 but they have yet to be consolidated into a full and complete forest inventory and monitoring program. In recent years, SBB has started to prescribe exploratory surveys, a 100% stock survey of logging units for intensively managed concessions as well as the production of a cutting register for every felled log in each logging unit. This provides a reliable sample of the actual output achieved but it is only a partial monitoring solution.

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b) forest law enforcement:
Forest law enforcement is the responsibility of the following agencies and institutions:

- Officially, the Forestry Service (LBB) is in charge of management of all forests in the widest sense of the word, thus including nature conservation and law enforcement.
- The Nature Conservation Division (NB) of the Forestry Service is the CITES authority, and is responsible for issuing permits for the export of CITES species, and therefore also for enforcement when the laws on hunting and wildlife (the Game Law 1954) are violated. In addition, NB is responsible for the enforcement of the Nature Conservation Act 1954.
- The Foundation for Forest Management and Production Control (SBB) is mandated by the Forest Service (LBB) to manage the production forests, and therefore is responsible for supervision and control of all logging. The forest management Act of 1992 enables forest guards to confiscate illegally logged timber and to enforce the Forest Management Act.
- In view of their responsibilities in general law enforcement, the Police Force and the Public Prosecutor's Office are authorized to apprehend and prosecute people who violate forestry laws.

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c) forestry and forest conservation:
The responsibility for the preparation and implementation of the national policy regarding nature conservation resides with LBB, which has not mandated any of these responsibilities to SBB. The day-to-day management is the responsibility of the Nature Conservation Division of LBB, with assistance of the Foundation for Nature Preservation (STINASU). An environmental law will be formalised to further articulate responsibilities for impact assessments, including of logging, mining and agriculture, impact studies and environmental legislation development among different ministries and institutes

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d) coordination across forest and agriculture sectors, and rural development:
The Ministry of Physical Planning, Land and Forest Management is responsible for land management, and for issuing permits to individuals and companies for forest exploitation and timber production. The Forest Service shares responsibilities with the Foundation for Forest Management and Production Control (SBB) established in 1998, which is in charge of the management of production forests.
Different ministries, such as Planning and Development Cooperation (PLOS), Labor, Technological Development and Environment (ATM), Regional Development (RO), Trade and Industry (HI), Finance, and Agriculture, Animal Husbandry and Fisheries (LVV) coordinate responsibilities for land use planning, environment, community forests, export levies and industry, determining levies and phyto-sanitary matters. Working with the Ministry of ATM, the National Institute for Environment and Development in Suriname (NIMOS) is responsible for the preparation of environmental policy, environmental legislation, and environmental impact studies. Each Ministry is responsible for specific components of the overall development policy. Cross-cutting issues are discussed during the weekly meetings of the Council Ministers, where coordination takes place.
However, an Interdepartmental (Ministerial) Committee, comprising representatives of the relevant Ministries will be established to specifically oversee the process of the REDD Readiness Plan. The Ministry of Physical Planning, Land and Forest Management (RGB) will take the lead and take responsibility for the formulation of a REDD Readiness Plan/REDD Strategy and the implementation of the Plan. The Foundation for Forest Management and Production Control (SBB) will continue to be closely involved in the entire process.

3. Current country situation (consider the use of Annex 1 to help answer these questions):

a) Where do forest deforestation and forest degradation occur in your country, and how extensive are they? (i.e., location, type of forest ecosystem and number of hectares deforested per year, differences across land tenure (e.g., national forest land, private land, community forest, etc.):
Suriname has the lowest population density of any moist tropical country on Earth and as a result, some 90 percent of its rainforest cover remains intact. Most people live along the coastal strip of the country, while the vast interior wilderness is inhabited by no more than 10 percent of the population, namely tribal Indigenous Amerindian and Maroon peoples. The country has a long tradition of forest protection based on legislation dating from 1954. There are 16 official protected areas in the country which together comprise 13 percent of the country's surface area.
Although recent deforestation rates have been relatively, low many current activities and pending requests are opening up avenues for increased deforestation. It is estimated that less than 1% of the total forest estate has so far been converted to mining, agriculture and hydroelectric energy production. New mining projects in the Bakhuys area (a possible concession of 280,000 hectares, of which it is estimated that ca. 5% will be deforested) and the Nassau area (49,000 ha), along with construction of access roads and a possible second reservoir for hydroelectric power, will have dramatic consequences for the forest and its functions.
The agricultural use of the forest is limited to shifting cultivation by the Indigenous and Maroon peoples who live primarily along the major rivers of the hinterland. In the "First National Communication under the United Nations Framework Convention on Climate Change (2005)" this area is estimated at 250,000 ha. Of late, the forest-based communities of the hinterland have also indicated an increased need for permanent agricultural land and modern agricultural methods to increase food production and decrease the labor-intensive shifting cultivation agriculture.
In the coastal plain, some types of swamp and savannah forests are exploited for timber production. In the past 10 years, the most important timber production area has been the "forest belt", which was increased from an area of some 2.5 million hectares to 4 million hectares. However, the net production area is estimated at approximately 2.5 million hectares due to the lower productivity of this area.

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b) Are there any estimates of greenhouse or carbon dioxide emissions from deforestation and forest degradation in your country? If so, please summarize:
Although the FAO 2005 Forest Resource Assessment reported no loss in forest cover, no time series of data have been carried out to substantiate this. Other more focused assessments have estimated recent deforestation in Suriname at:

- 4,200 to 5,380 ha per year (Becker et al 1999)
- 4,800 to 9,600 ha per year (small-scale gold mining alone, based on 1998 field work; Peterson and Heemskerk 2001)[1]

Applying a weighted average aboveground biomass carbon of 676 t CO2 equivalent per ha (368 t aboveground biomass per ha[2], Table 1) provides an estimate of annual emissions from deforestation of ~3.4 – 6.8 million t CO2 (5,000-10,000

[1] Peterson, G.D. and M. Heemskerk. 2001. Deforestation and forest regeneration following small-scale gold mining in the Amazon: the case of Suriname. Environmental Conservation 28(2):117-126.
Becker, C.R., Breinburg, H., MacDonald, H., Playfair, M. and H. Ramdihansing. 1999. Final report. Greenhouse gas emission inventory for Suriname, 1994. Project country study climate change, Suriname.
[2] Tjon, K. 1998. Monitoring tropical rainforest in Suriname: Internal Memorandum NARENA/CELOS

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ha per year).

Table 1. Aboveground biomass carbon density by forest type (calculated from Kenneth Tjon, 1998)

Forest type	Area (ha)	Aboveground biomass (t/ha)	t CO2e per ha
High swamp forest	593,829	140	257
Mixed marsh forest and high dryland forest	2,860,734	375	688
Savannah forest	305,174	329	604
High dryland forest	10,144,577	398	730
Creek forest	589,378	138	253
Low open scrub and liana forest	316,674	249	457
Total	14,810,366		
Weighted average		368	676

Emissions treated here are mostly related to forest cover loss due to mining activities. Emissions resulting from logging (i.e. degradation-related emissions, as most logging in Suriname is selective) are not included, and analyses capable of resolving these impacts have not been applied to date.

Despite the relatively low rate of deforestation when compared to total forest area (= 0.03% - 0.07% per year), recent rates of forest cover loss are not necessarily indicative of future rates, and increases in logging[3] and mining[4] activities, as well as planned new infrastructure (Appendix 3, Maps 1 and 2), portend increasing rates of deforestation in the near future in the absence of alternative incentives and improved governance.

The case of Suriname provides an opportunity to adapt REDD incentives to the context of tropical forested countries with historically low deforestation rates, but poised to enter new phases of development in which deforestation is expected to ramp up substantially. Potential emissions are enormous in this country with 14.8 million ha of extant forest. The challenge exists to develop a credible framework for the participation of countries like Suriname in REDD such that a development path resulting in widespread deforestation can be avoided before it begins.
Suriname's reference scenario will include modeling of these probable future projected emissions. REDD Readiness funding will produce maps of deforestation and degradation patterns, and the modeling will be based on both spatial (e.g. land-use allocations, infrastructure improvements, population, and demographic data) and non-spatial (e.g. sustainable forestry policy enforcement effects, economic development plans, socio-economic trends) data inputs and assumptions used to estimate likely land-use change.

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c) Please describe what data are available for estimating deforestation and/or forest degradation. Are data published? Describe the major types of data, including by deforestation and forest degradation causes and regions if possible (e.g., area covered, resolution of maps or remote sensing data, date, etc.).

Forest biomass carbon stocks in Suriname have been assessed by a number of studies[5] and through ongoing research by Tropenbos International. National forest inventories were conducted in 1971-1974 (FAO) and again in the mid 1990s Department of Natural Resources and Environmental Assessment (NARENA). Although field measurements are periodically taken from limited areas (e.g. in concession areas), there is currently no continuous and systematic national

[3] Playfair, M. 2007. Law compliance, and prevention and control of illegal activities in the forest sector in Suriname. Country assessment preliminary version. The World Bank
[4] Hammond, D.S., Gond, V., de Thoisy, B., Forget, P-M and B.P.E. DeDijn. 2007. Causes and consequences of a tropical forest gold rush in the Guiana Shield, South America. Ambio 36(8):661-670.
[5] Poels, R.L.H. 1987. Soils, water and nutrients in a forest ecosystem in Suriname. PhD thesis. Agricultural University Wageningen. 253 pp.
[6] Lindeman, J.C. and S.P. Molenaar. 1957. Classification of forest types. Preliminary Classification of Forested land of Suriname.
[7] Hammond, D.S., Gond, V., de Thoisy, B., Forget, P-M and B.P.E. DeDijn. 2007. Causes and consequences of a tropical forest gold rush in the Guiana Shield, South America. Ambio 36(8):661-670.
[8] Playfair, M. 2007. Law compliance, and prevention and control of illegal activities in the forest sector in Suriname. Country assessment preliminary version. The World Bank

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forest inventory system in place to directly monitor forest biomass.

Landsat imagery from 1998, with limited ground-truthing and confirmation with aerial photographs, was used to develop the Preliminary Classification of Forested Land of Suriname and Indicative Forest Classification maps (Annex 3, Map 5) by the Ministry of Natural Resources, in collaboration with NARENA, the Centre for Agriculture Research in Suriname (CELOS), the Foundation for Forest Management and Production Control (SBB), and the FAO. These maps will serve as a starting point for stratifying the forest into different strata (i.e., forest types) we will use the official forest type classification first developed by Lindeman and Molenaar (1957)[6].

In the context of remote sensing of forest cover and forest cover change, Suriname is a notoriously cloudy country. This requires duplicate satellite images of the same region, if using optical satellite data. Fortunately, both Landsat data from the U.S. and CBERS data from Brazil are well-archived for this region and are affordable for national-level monitoring. However, the creation of multi-date mosaics is laborious and expensive, and in the final analysis oftentimes unsuccessful. Fortunately, we now have access to RADAR data, from the Japanese-US sensor ALOS, which are being acquired and analyzed by colleagues at Wageningen Agriculture University and SARvision in the Netherlands to generate RADAR-based estimates of forest change for the Guiana Shield for the Japanese Space Agency (JAXA) – Kyoto Carbon project. These colleagues are also formal partners in the Guiana Shield Initiative. Landsat data are necessary to confirm forest trends prior to 2002 when the ALOS data became available. Experts agree that there is more information for forest monitoring in optical satellite data (Landsat) than RADAR data, both the optical and RADAR data have characteristics that make them appropriate for developing an accurate forest cover base-line map that is essential for estimating for carbon stocks in individual forest strata. Both types of satellite images have excellent locational precision and internal geometric fidelity, enabling a precise spatial co-registration of the time series of images and maps produced from them. Both data types have resolutions from 20 m to 30 m, allowing detection of forest clearings of less than two hectares with high accuracy. Future changes in forest cover will be monitored using RADAR data only, with changes being super imposed upon the forest cover classification derived by the fusion of RADAR and Optical imagery.

The Central Bureau of Aerial Survey (CBL) has aerial photographs for the entire country. These data have already been used to produce vegetation maps which can assist with validation for satellite forest assessments. Various GIS data layers are available through the Ministry of Physical Planning, Land and Forest Management, the Forest Service (LBB), SBB, CELOS and the institute for management of the Geographical Land Information System (GLIS). Annual data on timber production, from which degradation impacts can be estimated, are generated by the LBB and SBB. SBB's system for the monitoring of the log production and flow is LOGPRO, a computerized system showing origin of logs, volumes and destination. The concession database developed by the SBB is based on a GIS and linked to an "Overview of timber cutting license" map (Appendix 3, map 7).

d) What are the main causes of deforestation and/or forest degradation?

In 1993, Asian companies started to invest approximately over 40 million dollars up to date in forest sector in logging, processing and trading (export). The production of the traditionally larger Surinamese companies however, is declining or has even stopped.

To date, 450,000 ha of Suriname's original forest cover has been converted to other uses. Historically, deforestation has been caused by activities ranging from shifting agriculture, conversion to pasture for livestock (mostly prior to 1980), flooding of a hydropower reservoir (156,000 hectares in 1963) and establishment of plantation forests from savannah forests (before 1970).

The total area under continuous shifting agriculture is estimated at 246,700 ha, of which annually some 16,400 ha is re-cleared via slash and burn practices. Effectively, the current cultivation cycle prevents fallow vegetation from developing for more than 15 years. Shifting cultivation is generally situated along the major access roads, rivers and streams in the inhabited parts of the interior.

The principal driver of deforestation in Suriname in recent years has been mining, including both large and small-scale mining for bauxite and gold. In particular, there has been an exponential increase in gold production through the Guiana Shield; a recent analysis reported an increase in gold production in the region of *60-fold* from 1979 to 2004[7]. Despite a process for granting formal mining concessions (Appendix 3, Maps 3 and 4), much of this activity is un-authorized and conducted at small scales in a widely-dispersed manner that cannot be easily monitored for compliance.

Logging activities are an increasingly important source of emissions from forest degradation. Suriname's forests are rich in commercial timber species and are suitable for production purposes. Some 2.3 million ha of forest are or were once approved for timber production in Suriname, in the form of concessions, community/tribal forests, and timber cutting licenses (currently a total of 1,816,122 ha). Timber production has stagnated around 150,000 – 200,000m3/year in the past decades, which is about 10% of the potential sustainable timber production of production forests. The Government policy is to increase sustainable annual production to 500.000 m3. In 2005, roughly one quarter of the recorded timber production in Suriname was illegal[8] and possibly an additional estimated 20% went undetected. Road infrastructure and road improvement will facilitate access to more of the interior (Appendix 3, Maps 1 and 2), further enabling increased

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loss in Suriname, with development slated or underway for oil palm (10,570 hectares already cleared at 4 locations in the northern part of the interior) and banana plantations, rice cultivation (Multi Purpose Corantijn Canal Project in the western part of the country), and to a lesser extent horticulture (ornamental plants) and aqua-culture (conversion of marsh forest to establish fishponds).

Other contributing causes of deforestation and degradation include logging, commercial agricultural activities, and potentially new hydropower development (Appendix 3, Map 2). Finally, pressure from neighboring countries is likely to become an increasingly important contributor to forest cover loss in Suriname. Brazil, in particular, has a very large and dynamic human population that could rapidly move into Suriname for mining, logging and agricultural activities. Moreover, implementation of REDD and other conservation measures in Brazil may lead to international leakage of deforestation and degradation into Suriname if not effectively protected.

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e) What are the key issues in the area of forest law enforcement and forest sector governance (e.g., concession policies and enforcement, land tenure, forest policies, capacity to enforce laws, etc.?

Legal framework

The 1992 Forest Management Act, which replaced the 1947 Timber Act, is basically a legislative framework. The Act contains a number of requirements intended to promote sustainable forest management practice for the production of timber and non-timber products.

Concessions

A concession gives the holder the exclusive right to harvest and transport timber within the boundaries of the concession, provided the conditions stipulated in the 1992 Forest Management Act and subsidiary legislation are met, such as the royalty rates. The concession agreement also lays down further specifications, e.g. the need to undertake 100% enumeration in preparing the exploitation plan. Further provisions may be laid down by state decree with respect to division of the concession area, infrastructure, the terms and conditions to be met by the concessionaire and any guarantees to be given by the concessionaire. The concession may be extended only once and for an equivalent period of time only, and an extension fee is then due. The exploitation plan should, among other things, specify the maximum and minimum volumes by species or species group to be harvested within the concession.

Nature Conservation

The 1954 Nature Conservation Act is the most important law on protected areas. According to this Act, nature reserves can be established if this is in the interest of science, recreation and education, or for ethical, esthetical and economic considerations it is desirable to protect the country's natural richness. The CSNR is a nature reserve that covers 1.6 million ha of pristine forest. The Nature Conservation Division (NB) of LBB is responsible for the management of all nature reserves and multiple-use management areas, as well as the enforcement of this Act. However, NB is currently seriously understaffed to undertake these important tasks, although the policy of the GoS is aimed at expanding the area under protection.

Forest Policy

In 2003, the National Forest Policy was formulated in a participatory process with all relevant stakeholders, and currently a Strategic Action Plan is also being discussed in a participatory process.
The overall objective is to enhance the contribution of forests to the national economy and the well-being of current and future generations, with due regard for the conservation of biodiversity. In order to achieve this objective, capacity needs to be developed to use forest resources in an economically viable, socially equitable and ecologically sound manner. The overall objective has economic, socio-cultural and environmental goals.

In the process of elaborating the National Forest Policy, the lack of institutional capacity in both the private and public sectors was identified as one of the main constraints to achieve sustainable and rational management and use of the forest resources. A process of institutional reform of the forest management structure, which started in the mid 1990s, was further discussed, including the establishment of a full-fledged management authority (called Bosnas) replacing the existing SBB and LBB, which would help to ensure the implementation of the Forest Policy and promote the sustainable use of the forest resources. To realize this Authority, the relevant laws to establish and operationalize the Authority must first be in place. These laws have been prepared and now require approval from Parliament. There is also a need for financial inputs for initial investment until the Authority becomes self-sustaining after the planned four years. A US $4.6 million project has been formulated and submitted under the Dutch Development Aid facility allocated for this purpose.

In accordance with the Constitution of the Republic of Suriname (1987) all forests, except those on privately owned land, belong to the state. Forests on private land do not cover more than a total area of 50,000 ha. The Government grants land tenure for various purposes to private individuals, private enterprises and organizations, and communities. The 1992 Forest Management Act distinguishes three forms of tenure: 1) timber concessions, 2) community forests, and 3) incidental cutting licenses. The total area granted under timber cutting rights is currently 1,816,122 hectares, divided into timber concessions (1,093,877 ha), Community forest (547,859 ha), and Incidental cutting licenses (174,386 ha).

4) What data are available on forest dwellers in lands potentially targeted for REDD activities (including

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indigenous peoples and other forest dwellers)? (e.g., number, land tenure or land classification, role in forest management, etc.)

Suriname has an ethnically and culturally diverse population, which is shown in the following table, which outlines changes in ethnic distribution in Suriname between 1972 and 2004.

There is no exact information available on numbers of 'forest dwellers', for population data collected on the basis of ethnicity distinguishes urban (Paramaribo and Wanica District), rural (districts of Nickerie, Coronie, Saramacca, Commewijne and Para) and interior (districts of Marowijne, Brokopondo and Sipaliwini). The 'forested part' of the country comprises the districts of Sipaliwini and Brokopondo, but also parts of other districts that are categorized as 'rural'. Many traditional 'forest dwellers' are also physically moving to urban and rural parts of the country. The population projections 2004-2024[9], produced by the General Statistics Bureau, showed increasing migration trends from the 'interior' between 2003 and 2005.

Two traditional tribal groups can be distinguished as inhabiting the 'interior': the Maroons (descendants of black slaves who had escaped from the plantations and who settled along the major rivers of the country in the 18th and 19th centuries) and the indigenous Amerindian Peoples. They make up approximately 10% of the total population and live spread over numerous small permanent villages and settlements along the major rivers in the interior and parts of the rural districts. These tribal groups are referred to as 'forest dwellers' below. Gathering more information and statistics, and defining more accurately who should be included as 'forest dwellers' will need to be undertaken in the course of project preparation and during the stakeholder consultations.

Ethnic diversity of the population of Suriname 1972 – 2004

	1972		2004	
	absolute	%	absolute	%
Hindostani	142,917	37.6	135,117	27.4
Creole	119,009	31.4	87,202	17.7
Maroon	35,838	9.4	72,553	14.7
Javanese	57,688	15.2	71,879	14.6
Mixed			61,524	12.5
Others	24,155	6.4	31,975	6.5
Unknown			32,579	6.6
Total	379,607	100	492,829	100

Source: General Bureau of Statistics, Paramaribo (2005)

Forest dwellers

Several peace treaties were concluded with the former colonial power, which mentioned the areas where the groups who inhabited the interior were allowed to live and reside. The GoS maintains the principle of public domain, in which all land on which no title can be proven by others, remains the property of the state. The inhabitants of the interior, however, use the peace treaties in recognition of their right to the land they have inhabited for centuries. The generally applicable laws are based on individual ownership, while the customary laws of the tribal communities are based on collective ownership.

The Constitution of Suriname (1987) does not provide for collective land ownership, although 547,859 hectares of the forest has been granted as community forest to the Indigenous and Maroon peoples. Only a few concession areas are managed by the local communities themselves. In many cases, control of the rights and proceeds remains with the licensee (usually a village leader), and villagers have often complained that they do not receive an equitable share of benefits from their community forests.

The legal recognition of the collective land rights of tribal peoples is still in an embryonic phase in Suriname. An inventory of existing legislation has shown that a distinction must be made between laws that regulate the individual land rights of tribal peoples and laws that regulate the collective land rights of tribal peoples.

Follow-up and dialogue

Suriname now needs to accelerate the process to initiate a specific land rights system for indigenous and tribal groups. This process involves the determination of boundaries and the demarcation of the lands traditionally inhabited and used, and the granting of a title to these areas. As long as the Government has not realized this, the land rights internationally recognized as human rights of indigenous and tribal groups are absolute in the sense that the State has to refrain from all actions that could limit these land rights. The State should also guarantee that the indigenous and tribal groups share in the benefits, responsibilities, outcomes, and sometimes burden from the activity involved as reasonable and fair

[9] Bevolkingsprojecties voor de Republiek Suriname (Volume I, versie 1)

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compensation and as responsibilities for the exploitation of the land and the natural resources that they need for their survival ('benefit sharing'); that the expected social and economic impacts of the activity involved are assessed by an independent body under the supervision of the State ('environmental and social impact assessment'); and that damage to the traditional way of living of the indigenous or tribal group involved remains limited.
The GoS, amongst other things, established a Presidential Committee on land rights in 2006, which has done a study of the legislation and initiated a preliminary dialogue with the tribal peoples. The results and recommendations of this study were presented to the President in August 2008, but the report is not yet available to the public.

5. Summarize key elements of the *current* strategy or programs that your government or other groups have put in place to address deforestation and forest degradation, if any:
Suriname has expanded its timber production area from 2.5 million hectares to 4 million hectares. However, because of the lower production of this region, the potential for sustainable harvest is only 1 - 1.5 million m^3 annually. Starting from a cutting cycle of 25 years, 10 to 15 m^3 per hectare can be harvested if a steady expansion of the package of currently lesser known species is realized. In the past decades, the annual timber production stagnated around 150,000 m3 – 200,000 m3, which emphasizes the under-utilization of the sustainable production potential of the timber production area.

a) What government, stakeholder or other process was used to arrive at the current strategy or programs?
Different stakeholder platforms and processes have been used to develop a number of plans and strategies:
The Multi Annual Development Plan (MOP) for 2006-2011 was developed through a limitative stakeholder process, but describes a participatory process which will be utilized to monitor and evaluate the current plan and develop the following 5-year development plan. This participatory process is coordinated by the Ministry of Planning and Development Cooperation (PLOS).
The Biodiversity Strategy (2005) and the draft Plan of Action were developed in a participatory process through individual consultations with key stakeholder groups, and a series of stakeholder consultations and workshops with wide participation, including public, private, civil society and indigenous/ maroon representatives, as well as representatives from the scientific community.
The National Forest Policy (2003) was developed through a comprehensive participatory process with over 500 stakeholders Consultations took place in two series of three stakeholder consultation meetings. During these consultations, representatives from forest-based communities from the interior were provided with transportation and lodging to enable their full participation in this meetings. The first series of meetings provided a good insight into views, bottlenecks, problems and possible resolutions from the different stakeholders. In the second round, the first draft forest policy was discussed. In addition to the stakeholder consultation meetings, the project team also spoke with individuals and focus groups throughout the country, including visits to organizations, companies, and the traditional authorities in the interior, where traditional *krutu* (meetings) were held. The stakeholders represented a cross section of interest groups of various backgrounds (members of parliament, businessmen and entrepreneurs, representatives of the traditional authorities and communities living in the interior, the administrative service and other government agencies such as police and military, women and youth clubs, environmental organizations and scientists), while the formulation team received support in the form of advice and guidance from an inter-departmental policy advisory group and a steering committee consisting of prominent experts of various disciplines. Because of these intensive and general consultations, the policy had a wide social base.

All of the processes described above yielded documents, which were used as resource materials to formulate this RPIN.

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b) What major programs or policies are in place at the national, and the state or other sub national level?
The forest area of Suriname has a size and quality that is sufficient to meet the diversity of demands, including the conversion of forests to other land use, such as agriculture and mining, assuming that the soil is suitable for other land uses. At present, the ecological services from the forests are competing against mining, agriculture, animal husbandry and logging. The Government's position is that forest resources should be utilized in a sustainable manner to enhance the quality of life of the people of Suriname, and that income from forest resources needs to be increased through their rational use, that is to say, the production of timber and non-timber forest products as much as possible without clear-cutting. A specific target is mentioned in the country's Multiyear Development Plan 2006-2011 ('MOP') of doubling the area under active timber exploitation by 2010, and doubling timber export volume. Expansion in the timber, mining, agriculture, and energy sectors (hydropower) envisioned in the MOP sharply illustrates how REDD will have to be balanced against economic development plans.

6. What is the current thinking on what would be needed to reduce deforestation and forest degradation in your country? (e.g., potential programs, policies, capacity building, etc., at national or sub national level):

The deforestation rate in Suriname is very low, and currently deforestation is not a threat because of the country's

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tremendous and long-time efforts to protect and conserve its forests and to designate only part of the forests (ca. 4 million of the total 14.8 million hectares) for sustainable timber production. Moreover, only a relatively small part of the forest lands have been clear-cut for mining purposes (2,045 hectares for small-scale mining and 89,695 ha for large-scale mining). Forest degradation or fragmentation is estimated at 250,000 ha, mostly from shifting cultivation by forest-based communities. Logging is restricted to community forests and accessible timber concessions near the coast or along major rivers (Appendix 3, Map 6).
Given the high percentage of forest cover, land-use planning is the most important component of ongoing efforts to spatially organize the productive activities of the country. The significance of the forest area is not only considerable in terms of space, but it is also strategically important for the welfare of various social groups and the sustainable development of the national economy.

There is need for:
- development of a coherent land use map;
- development and execution of relevant baseline studies;
- research to develop and implement sustainable agricultural practices in areas with appropriate soils;
- research to establish and use criteria essential for sustainable logging, particularly the long-term studies that document the growth rate of key timber species, their reproductive cycles, and the ecology conditions necessary to ensure their recruitment into the forest canopy;
- Studies that address the cost and benefits from salvage logging as an integral part of to land-conversion projects aimed at increasing agricultural production;
- development of monitoring mechanisms
- development and implementation of new sustainable forest management protocols and criteria;
- capacity building to improve forest management, environment impact assessment (e.g. improvement of institutional and human resource capacity)
- awareness building about REDD and the importance of sustainable management of the forests

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a) How would those programs address the main causes of deforestation?

The programs to be developed would help to :
The programs to be developed would help with the following (see also Annex 4) :

- Analyze and test alternatives that address each deforestation and degradation driver (slash-and-burn agriculture, illegal and legal logging):
  - Help to establish the limits of land that could be cleared for agriculture, mining and other activities that result in deforestation and forest degradation;
  - Improve rehabilitation programs, especially in degraded areas around mining sites;
  - Improve sustainable and rational forest management, including the community forests through the formulation and implementation of criteria and indicators for sustainable forest management;
  - Improve traditional agricultural practices, including the introduction of pilot sites for permanent agriculture, which would decrease forest loss and fragmentation;
  - Develop and implement a monitoring and enforcement system.
  - Develop modalities
- Through base line studies, land use mapping, forest valuation, and reference scenarios, the opportunity costs of standing forests could be calculated and a better balance created between forest conversion and development. In addition, it will become clear why and which parts of the forest will probably have to be sacrificed for the sake of the country's development:
  - Assess historical emissions from deforestation and forest degradation;
  - Value forest resources
  - Make projection and modeling of future emissions from degradation and forest degradation;
  - Update biomass field estimates across all land-uses, including deforestation and degradation;
  - Create a national-level carbon methodology that includes project-level activities;
  - Develop carbon, biodiversity and social criteria and spatially-explicit dataset to target incentives to the highest outcome potential;
  - Establish national-level permanent biomass monitoring plots representative of all geographic regions and forest types, and create monitoring plan and protocol.

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- Develop modalities to avoid, in particular, planned and necessary forest degradation and deforestation by realizing opportunity costs

- Develop and implement a capacity building plan for all relevant governmental (SBB, NIMOS, GMB, CELOS), private agencies, forest-based communities, to enable and improve:
  - biomass monitoring activities,
  - carbon accounting and benefit sharing for targeted financial incentives for REDD
  - implementation of pilot projects/ demonstration plots;
  - law enforcement.
- Explore and utilize soil and standing forest carbon sequestration opportunities;
- Develop accounting rules for capture, storage and leakage.

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b) Would any cross-sectoral programs or policies also play a role in your REDD strategy (e.g., rural development policies, transportation or land use planning programs, etc.)?

The Multi-annual Development Plan emphasizes that economic development must proceed in a manner compatible with the environment, taking into consideration both national ecosystem services and global public goods issues such as climate change. The Plan notes that energy is a critical input for economic development, and highlights hydroelectric potential as a major component of Suriname's energy future. While hydroelectric power may offer an attractive emissions profile, it has direct implications for forested areas that need to be taken into account. The MOP furthermore places great importance on increasing accessibility of the interior, both to enhance opportunities for its inhabitants and to allow the region to contribute to national economic development. Planned improvement of existing roads, construction of new roads, upgrading of river-transport infrastructure, and expansion of air links all seek to unlock the interior and permit deeper penetration of logging, agriculture, livestock and mining sectors. Increased access will surely benefit populations in the interior, and strengthen the government's ability to provide social services and extend the rule of law and regulatory enforcement, but also augurs a sharp increase in the rate of deforestation and forest degradation.

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c) Have you considered the potential relationship between your potential REDD strategies and your country's broader development agenda in the forest and other relevant sectors? (e.g., agriculture, water, energy, transportation). If you have not considered this yet, you may want to identify it as an objective for your REDD planning process.

A multi-sectoral, nation-wide REDD strategy is needed, including a detailed analysis of how REDD-related revenues can be earned and used to cover part of the priority development activities laid down in the Multi-annual Development Programme (2006 – 2011), such as infrastructure, construction, energy (proposed biofuel plantations and hydropower plants), agriculture (proposed oil palm plantations), and mining (kaolin, gold, bauxite, oil). This REDD strategy, together with discussions on adaptation measures and a clean development mechanism, could lead to an action plan to be integrated in the next Multi-annual Development Plan (2012 – 2017) and would also ensure benefits to the people living closest to forest resources.

d) Has any technical assistance already been received, or is planned on REDD? (e.g., technical consulting, analysis of deforestation or forest degradation in country, etc., and by whom):

Technical assistance for a thoroughly assessment of deforestation and forest degradation is important to analyze deforestation or forest degradation in the country. The following initiatives are available and' or should be further explored:

- The *Sistema de Vigilância da Amazônia* (SIVAM) was set up in the early 1990s by the Brazilian Ministry of Aviation as a coordinating network, which administers a database and makes the data available to collaborating organizations. The *Sistema de Proteção da Amazônia* (SIPAM) is a working arm of SIVAM. Suriname participates in this data collecting network and it is considered one of the regional monitoring systems to be used for forest cover monitoring, but further information on the general use of these systems needs to be acquired from the Ministry of Defense.
- The European Commission-Joint Research Centre, together with the research institution IRD-Brasilia, use remote sensing to carry out surveys of forest cover. The satellite of IRD-Cayenne, Frans Guiana has a reach of 2600 km, and also covers Suriname. The two organizations are conducting a study for FAO in which forestation is compared on satellite images of 1990, 2000 and 2005. Suriname can participate in the research and could get access to free data and work on a baseline inventory. Also, several forest research groups based in French Guiana expressed an interest during the ATBC meeting held in Paramaribo in June this year to work with Suriname in monitoring on permanent plots. This needs to be further investigated and followed up.
- Amazon Cooperation Treaty Organization (ACTO) project TCP/RLA/3007 (A), Validation of 15 Priority Indicators

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for Amazon Forest Sustainability was implemented in the period 2004 - 2006. A proposal entitled 'Monitoring Deforestation, Logging and Land Use Change in the Pan-Amazon Forest' was thereupon developed, which is geared towards developing 'forest cover' as a practical criterion to achieve sustainable forest management. The project was approved this year by the ITTC for ITTO financing and funds are currently being sought. Expected software to be used: Deter and Spring geographic information system software and using the Brazilian experience.

- Suriname has not received any technical assistancy on REDD

7. What are your thoughts on the type of stakeholder consultation process you would use to: a) create a dialogue with stakeholders about their viewpoints, and b) evaluate the role various stakeholders can play in developing and implementing strategies or programs under FCPF support?

A similar process as the one used to develop the National Forest Policy in 2003 could be repeated for the formulation of a REDD strategy (see also 5a above). It yielded a policy with a wide social base and one which the stakeholders themselves refer to as a successful process that brought together the widest possible range of people, who did not usually meet one another. However, a significant amount of resources is required for this process, as well as a wide variety of expertise, not only knowledge of forestry and carbon, but conservation economy in general, as well as land rights, indigenous rights, anthropology, participation and development, gender, and liaisons and translators for the different tribal groups of the interior.

Learning from the 2003 process, a working group would first need to meet to review possibilities of REDD for Suriname and carry out a detailed stakeholder analysis, after which a comprehensive awareness campaign and a general stakeholder mobilization will have to be designed, even before the process is initiated, so that the funding for the project is sufficient to truly complete it. The costs of the full process in 2003 were already significant, and a substantial amount was spent on traveling to and from the interior to reach the different stakeholders through traditional and customary processes of dialogue, and in the different languages

a) How are stakeholders normally consulted and involved in the forest sector about new programs or policies?

Representatives of different Government divisions (including the district commissioners of the relevant districts), representatives of civil society and the private sector, representatives of the Indigenous Peoples (the associations VIDS and OIS) and the traditional Maroon structures, as well as representatives from the academic world (University and its research institutions) are consulted individually, or in key stakeholder groups, and through wide participatory meetings. A number of different participation platforms currently exist, which are utilized to discuss issues and develop action plans and strategies. These platforms also form the basis for monitoring the different plans and strategies being developed and implemented.

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b) Have any stakeholder consultations on REDD or reducing deforestation been held in the past several years? If so, what groups were involved, when and where, and what were the major findings?:

Since the mid 1990s, a number of workshops have been implemented to address forest-related issues, but not specifically on REDD. There have been small REDD-oriented consultations organized by Tropenbos International and the Ministry of ATM, which focused more on information sharing. The UNFF/ Paramaribo Dialogue (2008) was a Country-Led Initiative and discussed sustainable forest financing mechanisms.

c) What stakeholder consultation and implementation role discussion process might be used for discussions across federal government agencies, institutes, etc.?

An Inter-Ministerial committee could be set up especially to discuss REDD and elaborate and possibly coordinate implementation of REDD initiatives. The participatory process of the Multiannual Development Plan also provides a platform for stakeholder consultations across government, and with civil society stakeholders and donor agencies.

d) Across state or other sub national governments or institutions?

A decentralization process is currently being implemented, which aims at administrative decentralization of the districts. REDD could be introduced in the consultations organized in the different districts.

e) For other stakeholders on forest and agriculture lands and sectors, (e.g., NGOs, private sector, etc.)?

Stakeholder meetings, workshops and individual consultations could be held with and through existing civil society networks and organizations, since their outreach is quite effective at district and community levels.

f) For forest-dwelling indigenous peoples and other forest dwellers?

Meetings with traditional structures in the respective villages, followed by series of small village meetings and also larger meetings in Paramaribo, where representatives of the different groups can be brought together more efficiently.

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8. Implementing REDD strategies:

The capacity of the forests to keep carbon sequestered, keep freshwater circulating and maintain biodiversity has a global value. Economic development planning in Suriname intuitively turns to the country's extensive forest resources as a potentially promising opportunity. At present, the timber sector contributes less than 3% of GDP and the export from timber sector generates on the order of US$4-5 million per year, contributing less than 1% of the national export value. However, timber extraction, processing, and related activities account for about 5% of formal employment. The Multi-year Development Plan envisions these contributions to reach double these levels by the end of this decade. The implication for REDD activities in areas potentially suitable for timber extraction, mining, agriculture, livestock etc. is that REDD may impose an opportunity cost – economic benefits foregone as a consequence of restricting logging. The magnitude of this opportunity cost depends on the location of the particular forest area in question. Past estimates (Carbon and Conservation Markets for the Surinamese Forest Sector, by Eduard Niesten PhD), suggest a range from at least $6 per hectare per year in the forest belt along the coast, to less than $2 per hectare per year in forest areas in the less accessible interior. These figures pertain only to opportunity cost associated with foregone selective logging. In certain areas, potential economic returns from agricultural and mining conversion, will also need to be considered, among other things. Although this facet of opportunity cost resulting from REDD activities has yet to be explicitly assessed, analysis conducted in neighboring Guyana, which faces very similar conditions, suggests that in highly productive areas the opportunity cost can reach as high as $200 per hectare per year or more.

a) What are the potential challenges to introducing effective REDD strategies or programs, and how might they be overcome? (e.g., lacks of financing, lack of technical capacity, governance issues like weak law enforcement, lack of consistency between REDD plans and other development plans or programs, etc.):

REDD strategies will be weighed against other sustainable income-generating activities from the forest.

Challenges

- There are insufficient financial resources to implement certain existing policies, such as the National Forest Policy, and the Interim Strategic Action Plan for the forest sector of Suriname as priority strategies, and there are no specific training programs on REDD in Suriname.
- Equity-benefiting from REDD mechanism as a country with high forest cover and low deforestation

Moreover, a REDD strategy to be developed will have to deal with at least the following:

- Financing for land use planning, quantifying the resources, capacity building, developing a special REDD strategy and action plan, since Suriname is a high forested country with low forest degradation and underutilization of the timber forest products;
- Technical capacity strengthening in remote sensing, monitoring, carbon accounting;
- Use of methodologies and guidelines for project development and implementation, as well as for project monitoring, emissions accounting;
- Governance aspects, including implementation of the national forest policy, national biodiversity strategies;
- Organizational aspects, including coordination of REDD within the Government structures: mechanisms for transparency, equitable and viable benefit sharing

b) Would performance-based payments though REDD be a major incentive for implementing a more coherent strategy to tackle deforestation? Please, explain why. (i.e., performance-based payments would occur *after* REDD activities reduce deforestation, and monitoring has occurred):

As a high forest-cover and low deforestation country, payments through REDD will give incentives to improve sustainable uses of the forests and would ensure better monitoring of the forests.

9. REDD strategy monitoring and implementation:

There are three components to a national forest strategy to monitor forest carbon: 1) forest inventory based on permanent monitoring plots that are re-sampled periodically (every 2 yrs), 2) allometric formulas that convert forest inventory data into biomass estimates and 3) cartographic information from remote sensing technologies that provide accurate land cover information, which should be updated annually. Surinam has good preliminary data for all three components, but each component must be upgraded to ensure precisions and accuracy as part of REDD monitoring system

a) How is forest cover and land use change monitored today, and by whom? (e.g., forest inventory, mapping, remote sensing analysis, etc.):

Monitoring forest cover is the responsibility of the LBB and SBB, and in the near future of the Forest and Nature Management Authority (now called BOSNAS). Limited forest inventory, mapping, and remote sensing analyses are done by SBB, CELOS and GLIS, and there is an urgent need for improved institutional capacity to carry out this work.

A National Forest Inventory was carried out by the FAO in 1971-1974, focusing on three regions in the coastal belt of potentially exploitable forests. NARENA carried out another large scale forest inventory in the interior in the mid 1990's. Although field measurements are periodically taken from limited areas (e.g. in concession areas), there is currently no continuous and systematic national forest inventory system in place to directly monitor forest biomass.

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SBB is currently exploring new approaches to track forest cover change, which could include the application of Landsat and RADAR data from the Japanese-US sensor ALOS described previously. SBB is also investigating the application of new methods to analyze Landsat imagery to resolve logged forest areas, but the well-known limitations of this technology in cloudy regions essentially preclude its application in Suriname. .It is also difficult or very costly to get the update Landsat Imageries.

b) What are the constraints of the current monitoring system? What constraints for its application to reducing deforestation and forest degradation? (e.g., system cannot detect forest degradation of forest stands, too costly, data only available for 2 years, etc.):

There is currently no time series of classified remote sensing data maintained to monitor changes in forest cover. Tracking of permitted land clearing activities through the compliance process is insufficient due to the magnitude and dispersal of un-authorized activities and incomplete monitoring for compliance.
The technical capacity for dealing with remotely sensed information must be built and strengthened, although as noted in the previous section, there are possibilities for training in forest monitoring with both optical and RADAR data.
Although forest inventories are periodically carried out in limited areas (principally in concession areas), there is currently no continuous and systematic national forest inventory system in place to directly monitor forest biomass or to accurately model forest degradation using surrogate information, such as timber volumes or spatially explicit databases that show annual logging, agricultural and mining activities. Previous national forest inventories lacked uniformity in collected data, hence there is a need to institute a systematic, standardized approach.

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c) How would you envision REDD activities and program performance would be monitored? (e.g., changes in forest cover or deforestation or forest degradation rates resulting from programs, using what approaches, etc.)
The unique configuration of deforestation in Suriname requires a system that can also detect scattered small-scale forest cover loss to quantify the cumulative impact at the national level. The characteristically low harvest intensity of logging (8-15 m^3 per ha) and the prevalence of small scale and dispersed gold mining activities demand a different approach than that from used by countries with dramatic and well-defined agricultural frontiers. However, the limited utility of optical imagery in cloudy regions essentially precludes this technology as a viable option for Surinam. A more robust system can be organized using radar imagery (ALOS Palsar) and GPS ground mapping of logging roads using hand-held GPS devices. The ability of any remote sensing technology to detect low intensity forest clearings is as yet very limited, it will be necessary to send a team of topographers with GPS devises to the forest once a year. This team can map the extension of all roads skidder in the area's where logging is ongoing.

The GPS ground data can be used to model and estimate forest degradation; the GPS team will not only map the extent of new logging road s and skidder, but at localities selected via a stratified random procedure (stratified to mae sure it is an area being logged, but randomly within this area to avoid bias) to more precisely map individual tree falls and skidder trails. This more precise information then will be extrapolated over the logged area - which we assume will be that part of a concession undergoing logging in that year (note: concessions following guidelines recommended by the Forest Stewardship Counsel (FSC) typically subdivide the concession into blocks and each block is subject to harvesting each year. This method of estimating forest degradation following logging was developed by Winrock Int. for the Noel Kempff Mercado Climate Action Project (Bolivia) for areas experiencing selective logging that standard remote sensing technologies can not detect.

Nonetheless, the ALOS Palsar data will provide a complimentary data set, which should allow us to refine this ground based data to derive even more precise estimates of forest degradation.. Since ALOS is a L-band radar satellite it is an active sensor that receives a return from microwave signals targeted at the Earth. The intensity of the return (known as backscatter) is correlated with complexity and quantity of the target landscape; since complex vegetation types absorb the radar signal, low biomass landscapes have a higher signal than high biomass landscapes. Consequently, by combining the ground truth GPS data with radar data we should be able to come up with spatially precise measurements of forest degradation. It is important to note that radar data is saturated at biomass levels above 100 tons per hectare, which will be sufficient to detect forest clearing, logging roads, and large clearings, but not smaller amounts and is why it is essential to include the GPS ground truth component.

What is required is a time series of classified imagery that can be monitored annually (or less frequently if land-use change remains low in Surinam), and this will be supplemented by data derived from ground based mobile GPS devices and forest inventory assessment. As described in Section 3c, our colleagues in the Netherlands and partners in the Guiana Shield Initiative and JAXA-Kyoto Carbon project are processing and analyzing RADAR data to produce a time series of forest cover change for Suriname, and this technology and capacity will be transferred to the SBB. The activities under this project will measure complex forest degradation at the national level and the REDD funding will greatly assist

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this process.

The formulation and implementation of a national system to monitor emissions and emission reductions would be the basis for performance payments. Independent third party verification of this monitoring is critical. This process would entail training staff of the SBB and other relevant agencies, and the capturing of forest data for REDD purposes, as well as processing and analysis of this data. Data from remote sensing, forest inventories etc. would also be incorporated in this analysis. The monitoring system will also look at other benefits such as improvements in livelihoods, and positive and negative effects on biodiversity.

Suriname's rapidly changing development trajectory further demands an objective methodology to establish a reference case scenario that reflects its future and not its past. Simple historic base-lines are not adequate, because they characterize a different economic and social dynamic that has led to low rates of deforestation; Suriname is now embarking on a more dynamic development trajectory and a deliberate strategy to increase the exploitation of its natural resources, including an expansion of agriculture, mining and sustainable timber production. Therefore, Suriname's reference scenario must be based on a modeled future economy and the projected emissions that would occur under a business as usual assumption that would normally accompany changes in land-use allocations, infrastructure investments, demographic and socio-economic trends, policy and enforcement, and any other causal or correlative factors that can be used to infer forest cover change with known levels of uncertainty.

10. Additional benefits of potential REDD strategy:

Suriname is a significant part of the Guianan Region, an expanse of more than 250 million hectares, representing the largest block of intact tropical forest on Earth. In biogeographic terms, the Guianan Region's borders extend beyond the limits of the Guayana Shield itself, including all of Suriname, Guyana, and French Guiana, all of Venezuela south of the Orinoco, southeastern Colombian Amazonia, and all of the Brazilian states of Amapá and Roraima, and the northern portions of the states of Amazonas and Pará. Lying at the heart of this region, the forests of Suriname are remarkably pristine, with huge expanses of closed-canopy forest, tropical savannah, and wild, unpolluted and unexploited river systems, a particularly rich biodiversity, a variety of ecosystems.

There are immense stocks of carbon in the living biomass of the forests, and although the importance to global climate is difficult to assess, there would undoubtedly be significant impacts if much of this forest were destroyed. The overall strategy, therefore, is to benefit from standing forests as a carbon reservoir, although significant research will be needed to start to assess carbon stocks, non-carbon benefits, as well specific accounting principles on watershed benefits.

a) Are there other non-carbon benefits that you expect to realize through implementation of the REDD strategy (e.g., social, environmental, economic, biodiversity)? What are they, where, how much?

Research on REDD must be implemented to assess non-carbon benefits and specific accounting principles on watershed benefits. There is a real possibility that some forest area will be converted to agriculture, mining, and hydro energy for the social and economic development of the country.

Designing and utilizing sustainable financing mechanisms (including sustainable logging in concessions and community forest management) can encourage sustainable timber and non-timber forest products and services, which will result in sustainable income generation for communities and in maintaining forest cover and forest services.

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b) Is biodiversity conservation being monitored at present? If so, what kind, where, and how?

In the 1980s and earlier, specific permanent vegetation sampling plots were established by CELOS/Narena.

A monitoring program was recently started at one site in the CSNR with the help of Conservation International, which is part of a larger, worldwide TEAM program and is based on standard protocols for vegetation, climate, and a limited number of species. A monitoring plan for the entire nature reserve is in the process of being developed.

Bigi Pan and Galibi also have specific monitoring projects, set up on the basis of existing management plans.

It is expected that within the concession of the private company SUMA LUMBER LL.C some permanent sample plots will be established for biodiversity monitoring, as this company is the first Suriname one which is FSC certified.

Camera trapping has been undertaken during exploration activities in the Bakhuys area in West Suriname by the BHP Billiton, and is also being undertaken by Newmont in the Nassau goldmining exploration concession in East Suriname.

c) Under your early ideas on introducing REDD, would biodiversity conservation also be monitored? How?

Biodiversity could be monitored, using indicators to be established during the design of the baseline, in specific ecosystems. The use of Remote Sensing will be increased to monitor forest cover, and a monitoring program will be further developed and implemented on the basis of the national biodiversity strategy.

Other possibilities could be the involvement of local communities to help monitor biodiversity in protected forest areas and forests near their villages. A biodiversity monitoring pilot project using camera trapping is currently being implemented near the indigenous village of Kwamalasamutu in South Suriname, where local people have also been recently trained as park guards.

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d) Are rural livelihood benefits currently monitored? If so, what benefits, where, and how?
The Ministry of Regional Development, as well as a number of NGOs, are engaged in monitoring rural livelihood benefits. A number of forest-based communities are engaged in log production, the gathering of non-timber forest products, agriculture and small-scale of tourism activities.

The livelihoods of some local communities have been assessed during social and environmental impact assessment studies conducted by mining companies, by CELOS during a community forest-related project in Marshallkreek and during a process of forest certification of E-Timber LL.C. in the Mapane Area. These could serve as baseline studies for monitoring.

In the 2004 census, some livelihoods aspects were included, and it was envisaged that the next census will be conducted (2012) which be able to give some trends. And in a number of UN programs, studies are conducted on livelihoods and possible benefits.

However, no standard methodology is used, and activities need to be coordinated.

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e) Under your early ideas on introducing REDD, would rural livelihood benefits also be monitored? How?
Local communities will be involved in monitoring the protected areas especially in those area where they all already involved in the management, and in forest areas which they themselves manage (community forests). Any monitoring methodology or system to be set up must, therefore, be simple and cost effective, whilst the the capacity of the local communities will have to be strengthened.

11. What type of assistance are you likely to request from the FCPF Readiness Mechanism?

- **Identify your early ideas on the technical or financial support you would request from FCPF to build capacity for addressing REDD, if you are ready to do so. (Preliminary; this also could be discussed later.)**
- **Include an initial estimate of the amount of support for each category, if you know.**
- **Please refer to the Information Memorandum and other on-line information about the FCPF for more details on each category**

So far, Suriname has no experience with REDD activities. There have not been any estimates as yet for the amount of financial support in the process. It is important to identify what baseline studies need to be carried out so as to gather data and information, which are currently lacking. The first thing that needs to be done is to identify capacity gaps and build and strengthen the necessary capacity. One of the capacity gaps already identified is the need for assistance “from proven skilled experts” to formulate and implement projects. (See also annex 4 for more details).
Assistance is also required for the following:
- Assessment of historical emissions from deforestation and degradation;
- Future projection of emissions from deforestation and degradation, using national reference scenario;
- Preparation and formulation of a national REDD strategy; and
- Establishment of a monitoring system for emissions from deforestation and degradation.

a) Setting up a transparent stakeholder consultation on REDD (e.g., outreach, workshops, publications, etc.):
Suriname has experience with large multiple stakeholder consultations (e.g. during the formulation of the National Forest Policy, National Biodiversity Strategies, Strategic Action Plans, Multiannual Development Plan) and has conducted successful national, regional and local workshops, training and seminars. The process for REDD will most likely follow the 2003 National Forest Policy Formulation process, taking into account the lessons learned during this process.

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b) Developing a reference case of deforestation trends: Assessment of historical emissions from deforestation and/or forest degradation, or projections into the future.
As described in Section 9c, Suriname’s national circumstances indicate that past trends likely do not fairly represent expected trends in the near future. We will, therefore, need to produce a projected baseline of both deforestation and degradation. Deforestation projections will be based in part on econometric modeling and spatial modeling, supported by assumptions and best estimates of specific parameters that will come from expert workshops in Suriname. We will use the IDRISI modeling software to determine which areas are most likely to be deforested by when, based on land-suitability analyses, access, population distribution and movement, past associations of deforestation patterns with these and other factors within Suriname and neighboring areas, and mathematical modeling of future trends. While this may sound like much jargon, this approach has commonly been applied in many site level projects and also fits within almost all of the proposed approaches for national-level baselines submitted to the UN FCCC. The approach is also globally applicable, as in most areas data on these factors are available. The approach is also similar to the methodology proposed at the site level for the World Bank’s Biocarbon Fund. Our partner, CI, is on the review panel of the Biocarbon Fund methodology and is also on the methodology review team of the Voluntary Carbon Standards. Finally, CI has partnered for years on such modeling with Clark Labs, creators of the IDRISI models and international leaders in land-use change modeling.

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c) Developing a national REDD Strategy: Identification of programs to reduce deforestation and design of a system for providing targeted financial incentives for REDD to land users and organizations (e.g., delivery of payments, governance issues, etc.):

- Capacity building and strengthening
- Implementation of the National Forest Policy and National Biodiversity Strategy
- Spatial planning: create a land use map
- Promote standing forests as a carbon reservoir and the role of sustainable logging in this
- Promote the inclusion of standing forests in the REDD scheme and Global Payment for Ecosystems Services (GPES)
- Promote, assess and market carbon credits (also on voluntary markets)
- Establish a System of transparency, equity sharing of revenue from carbon credits or ecosystems services
- Institutional strengthening for the implementing and monitoring institutions
- Long-term monitoring of development processes by the Government

The strategy must include and benefit all stakeholders, be geared towards sustainable development, and should take into account the priorities of the government.

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d) Design of a system to monitor emissions and emission reductions from deforestation and/or forest degradation:

We intend to first complete a baseline time series of deforestation and degradation, which will include our colleagues in CI and the Netherlands team working on the JAXA-Kyoto Carbon project, among others. As the project is implemented, we plan on monitoring trends every two years. A high level of technical and financial support will be required to build the capacity to establish in-country monitoring described above.

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e) Other?:

- Design a particular category of the HFLD countries (countries with more than 70% forest cover and low deforestation) for preventive credits as an addition to the REDD mechanism. Details would be worked out during the consultation process with the stakeholders.
- Design national institutional and legal framework.
- Design alternative funding mechanisms, including Global Payment for Ecosystems Services (GPES)
- Design collection and distribution of revenue from REDD-related activities

12. Please state donors and other international partners that are already cooperating with you on the preparation of relevant analytical work on REDD. Do you anticipate these or other donors will cooperate with you on REDD strategies and FCPF, and if so, then how?

The following organizations are interested to participate in a well-structured program: Suriname Conservation Foundation (SCF) through RedLAC, WWF and WWF-Guianas Program, CI and CI-Suriname and Tropenbos International and Tropenbos International Suriname. These organizations already collaborate with one another and have initiated a regular meeting to coordinate their programs and activities, in particular the capacity building and institutional strengthening components.

The WWF Guianas Program has stated its willingness to support the government through capacity building and the development of pilot projects for sustainable forest management and sustainable management of peat swamps in the western coastal area. The following potential pilot sites were also identified in May 2008 for REDD in sustainable forest management and harvesting of NTFPs. In both case the local community will be involved in the execution of the project:
- Pokigron Community forest (12,000 ha) situated south of the Van Blommenstein Lake.
- Sipaliwini Nature Reserve (total area 100.000 ha) on the border with Brazil.

Suma Lumber LL.C, the first company in Suriname with FSC certified concessions, will establish permanent sample plots for biodiversity monitoring

CI-Suriname has stated its willingness to assist the Government in framing a 'green Suriname' strategy, which could include the development of alternative financing mechanisms and capacity building.

13. Potential Next Steps and Schedule:
Have you identified your priority first steps to move toward Readiness for REDD activities? Do you have an estimated timeframe for them yet, or not?

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The potential next steps for REDD readiness:

- Development of an extensive awareness campaigns to reach all stakeholders, involving them in decisions on potential benefits and in formulating a REDD strategy, and to develop a strategy to ensure that HFLD countries, like Suriname, can also benefit from REDD programs.
- Establishment of a climate change committee, and RPLAN development assessment.
- A technical reference scenario that includes future projected emissions, development factor adjustment, and monitoring plan.
- Obtaining remotely sensed data and the ability to analyze historical emissions from the forest sector, and the potential to model future emissions.
- Development of a forest inventory and monitoring plan.

14. List any Attachments included
(Optional: 15 pages maximum.)

1. **Additional Technical Information**
2. **Resource Materials**
3. **Maps**
4. **General Readiness Plan Activities**

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Annex 1 : Additional Technical Information

1.1 TECHNICAL

Physical

(1) Does your country have a forest inventory? (Forest inventories typically provide very accurate, on-the-ground estimates of timber volume, biomass, etc. Together with statistics on forest-area change, access to forest inventory data is critical to quantify carbon emissions resulting from land conversion.)

- **Is it a national or regional (protected areas only) inventory? (It is important to know how representative the inventory is of existing forest conditions)**
- **When was it implemented? (If an inventory was conducted only once in the distant past it will not be representative of current conditions but may be useful for establishing historical baselines)**
- **What is the spatial intensity (i.e., plot density) and temporal frequency (i.e., time between inventories) of data collection? (The higher the spatial and temporal frequency, the greater the capacity to monitor forest change)**

National forest inventories were conducted in 1971-1974 (FAO) and again in the mid 1990s (Department of Natural Resources and Environmental Assessment (NARENA)). There is currently no continuous national forest inventory system in place.

- **Are sample plots permanent, i.e., revisited and re-measured during subsequent inventories? (Permanent plots are more useful for monitoring forest carbon uptake/emissions)**

No

- **Is remotely sensed data used? If so, how? (Remotely sensed data can be useful in determining *where* changes are taking place, a question that may not be answered well with traditional inventory data)**

1998 Landsat imagery was used to create Preliminary Classification of Forested Land of Suriname and Indicative Forest Classification maps. There is currently no time series of classified remote sensing data maintained to monitor changes in forest cover.

(2) Are locally derived, species-specific allometric biomass equations available? (Allometric equations are needed for computing biomass estimates from forest inventory data. Local allometric equations provide more accurate estimates of biomass than regional equations do.)
No

(3) Do you have access to remotely sensed data (satellite imagery, aerial photography)?

In process. Our colleagues in the Netherlands have access to and are analyzing ALOS data as part of the JAXA-Kyoto Carbon project. Both Landsat and mosaics of ALOS RADAR data will begin to be made available for free in late 2008.
The Government's Bureau for Cartography maintains an archive of aerial photographs for Suriname.

(4) What spatial data do you have access to?

- Landsat imagery from 1998
- Preliminary Classification of Forested Land of Suriname map (1998)
- Indicative Forest Classification map (1998)
- Digital elevation model

GIS coverages:

- Transportation networks (roads and rivers)
- Mining concessions
- Forestry concessions
- Protected areas
- Population centers

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- Indigenous settlements
- Maps of the 1992 Priority Setting Workshop for the Guayana Region (which includes Suriname)

1.2 ANALYTICAL

(1) Briefly summarize the most important studies related to deforestation and/or land use/land cover change in your country, including issues on governance, legal frameworks, infra-structure and socio-economic dynamics?
(This will provide an overview of what information is available today for policy makers. Provide background and details of the research available, and briefly review the relevant literature under the headings of: physical; social; economic)

- Tropenbos International publications and ongoing research in-country
- Playfair, M. 2007. Law compliance, and prevention and control of illegal activities in the forest sector in Suriname. Country assessment preliminary version. The World Bank
- FAO 2005. Global Forest Resources Assessment 2005. Suriname Country Report. Forest Resources Assessment Programme. Working Paper 213. Rome.
- ITTO Suriname Country Report 2003
- Tjon, K. 1998. Monitoring tropical rainforest in Suriname: Internal Memorandum NARENA/CELOS
- Becker, C.R., Breinburg, H., MacDonald, H., Playfair, M. and H. Ramdihansing. 1999. Final report. Greenhouse gas emission inventory for Suriname, 1994. Project country study climate change, Suriname.
- Ecosecurities Ltd. 2002. A baseline analysis for the Guiana Shield region. Report for NC-IUCN.
- Lindeman, J.C. and S.P. Molenaar. 1957. Classification of forest types. Preliminary Classification of Forested land of Suriname.

(2) Describe the known and perceived gaps in this research. What kind of information is still be needed? (Comment on technical gaps that are apparent or, should that knowledge not be available, on what is believed to be the most useful information that is not yet available).

Research on accurate and cost-effective approaches to measure the rate of fine scale forest cover change at the national level. Research on the optimal design of a continuous national forest inventory. Research on deforestation drivers and projection of forest cover change.

(3) How much of this research was conducted by in-country experts? (If none, estimate the percentage of the research completed wholly by, or in conjunction with, international researchers – the objective is to identify a current level of independent in-country research capacity and involvement. The long term objective will be to have combined national and international teams, and this question provides a benchmark of local participation.)
Most forest research conducted was done with local counterparts in Suriname.

(4) Describe the known or perceived gaps in in-country analytical capacity. (Comment on what gaps are apparent or, should that information not be available, on what is believed to be the most useful addition to analytical capacity.)

Capacity building for LBB, SBB, BOSNAS, GLIS and NARENA/CELOS is needed in both manipulation of remote sensing data to monitor forest cover change and in administration and implementation of a continuous systematic national forest inventory.

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Annex 2: Resource Materials

Becker, C.R., Breinburg, H., MacDonald, H., Playfair, M. and H. Ramdihansing. 1999. Final report. Greenhouse gas emission inventory for Suriname, 1994. Project country study climate change, Suriname.

De Dijn B., Molgo I., Norconk M.A., Gregory L.T., O'Shea B., Marty C., Luger M., Ringler M., et al. The biodiversity of the Brownsberg. In: A Rapid Biodiversity Assessment of Lely and Nassau Mountains, Suriname. . Alonso L.E., Mol J.H. Conservation International. Washington, D.C

Ecosecurities Ltd. 2002. A baseline analysis for the Guiana Shield region. Report for NC-IUCN.

FAO 2005. Global Forest Resources Assessment 2005. Suriname Country Report. Forest Resources Assessment Programme. Working Paper 213. Rome.

Hammond, D.S., Gond, V., de Thoisy, B., Forget, P-M and B.P.E. DeDijn. 2007. Causes and consequences of a tropical forest gold rush in the Guiana Shield, South America. Ambio 36(8):661-670.

Draft Report, Interamerican Development Bank, June 2007

Lindeman, J.C. and S.P. Molenaar. 1957. Classification of forest types. Preliminary Classification of Forested land of Suriname.

Niesten, Eduard. Hardner & Gullison Associates, LLC. Carbon and Conservation Markets for the Surinamese Forest Sector, prepared for Conservation International, May 2000.

Playfair, M. 2007. Law compliance, and prevention and control of illegal activities in the forest sector in Suriname. Country assessment preliminary version. The World Bank

Peterson, G.D. and M. Heemskerk. 2001. Deforestation and forest regeneration following small-scale gold mining in the Amazon: the case of Suriname. Environmental Conservation 28(2):117-126.

Poels, R.L.H. 1987. Soils, water and nutrients in a forest ecosystem in Suriname. PhD thesis. Agricultural University Wageningen. 253 pp.

Souza, C.M, Roberts, D.A. and M.A. Cochrane. 2005. Combining spectral and spatial information to map canopy damage from selective logging and forest fires. Remote Sensing of Environment 98:329-343.

Tjon, K. 1998. Monitoring tropical rainforest in Suriname: Internal Memorandum NARENA/CELOS

<u>Also the following documents:</u>

- Multi Annual Development Plan (MOP) 2006-2011
- National Forest Policy 2003 and Interim Strategic Action Plan 2008
- National Biodiversity Strategy
- First National Communication Report under the UNFCCC 2005
- UNFF/CLI report (The Paramaribo Dialogue) 2008 and Draft Suriname Case Study (input for the UNFF/CLI meeting

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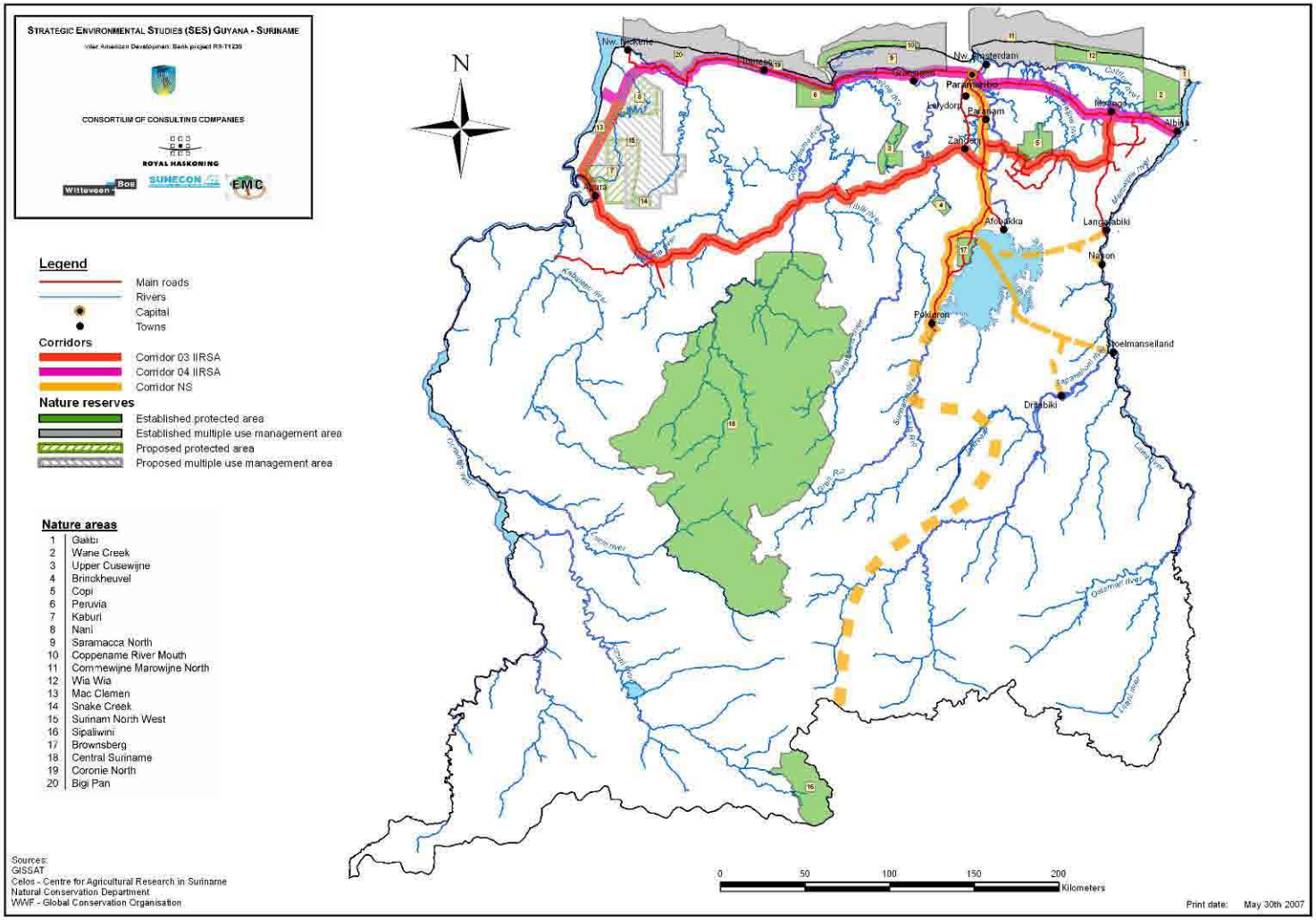
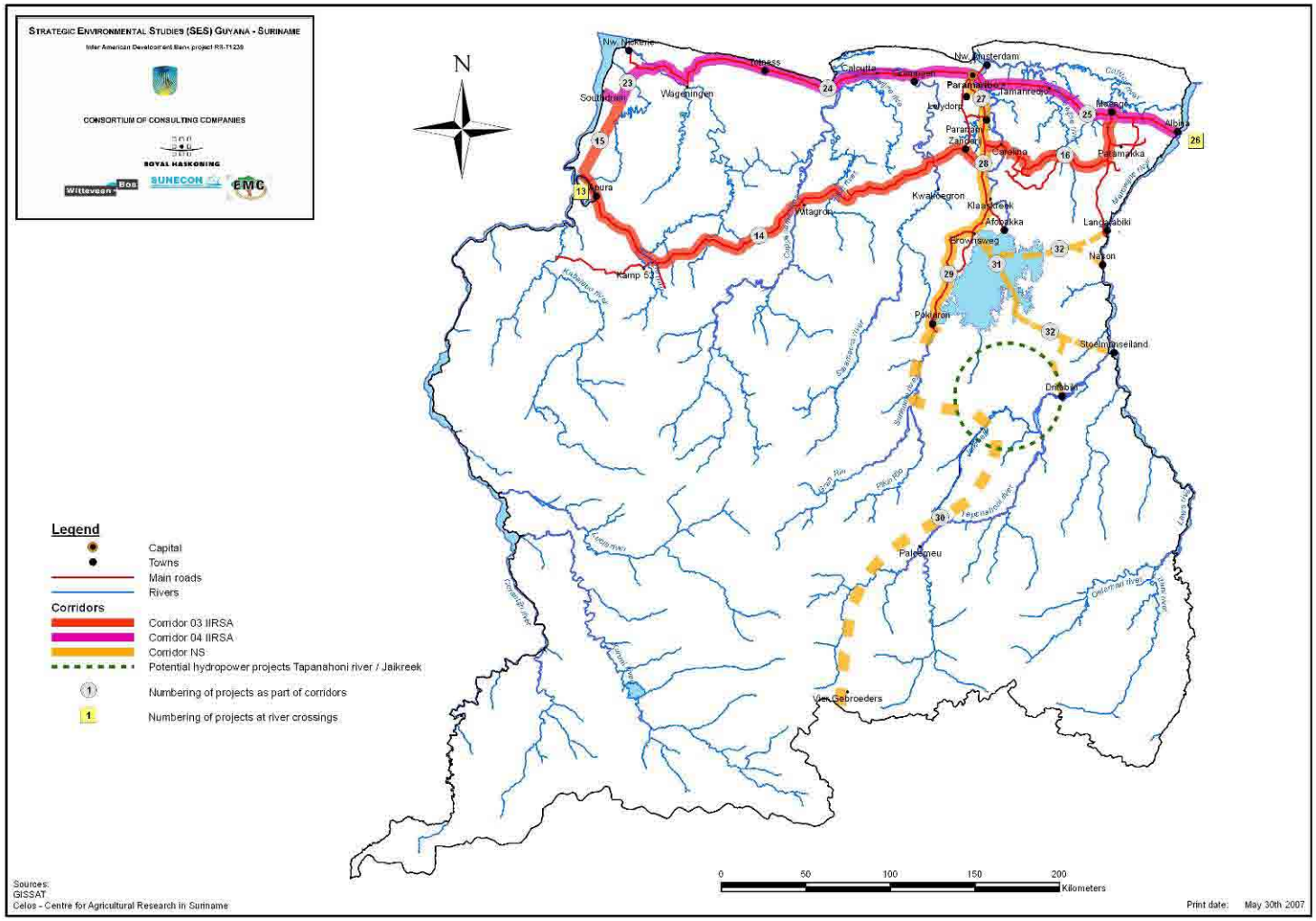
Annex 3: Maps

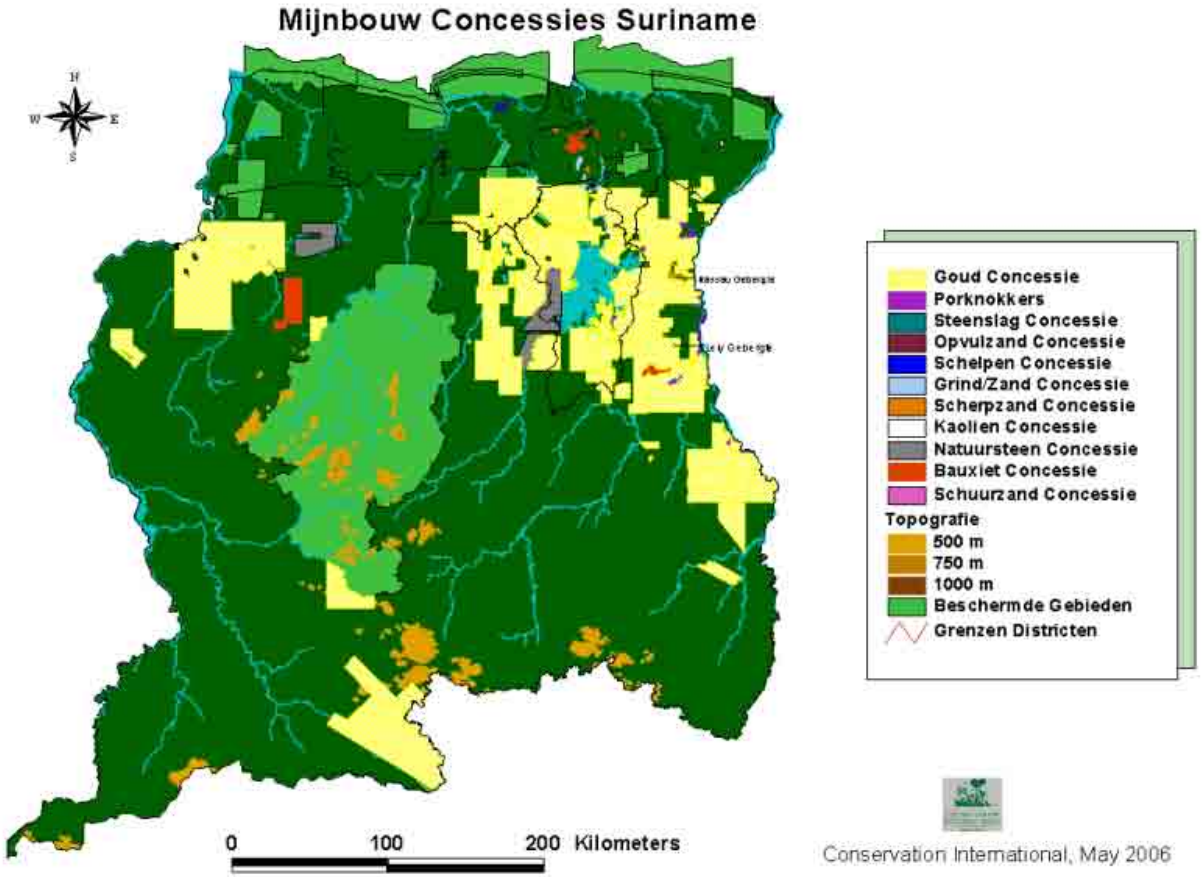
Map 1. Roads and protected areas in Suriname.



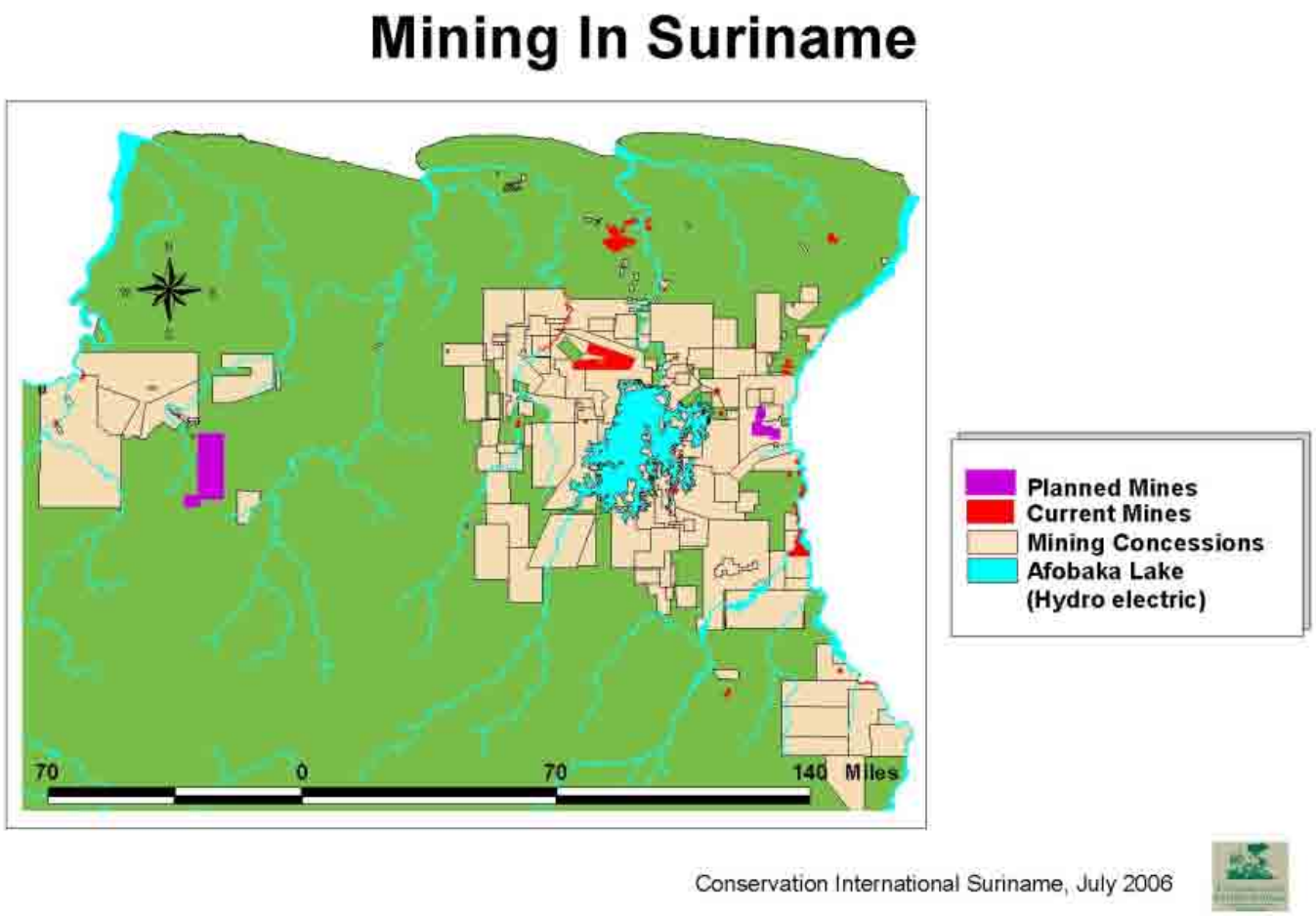
Map 2. Roads and prospective hydro-electric plant (circled) in Suriname.



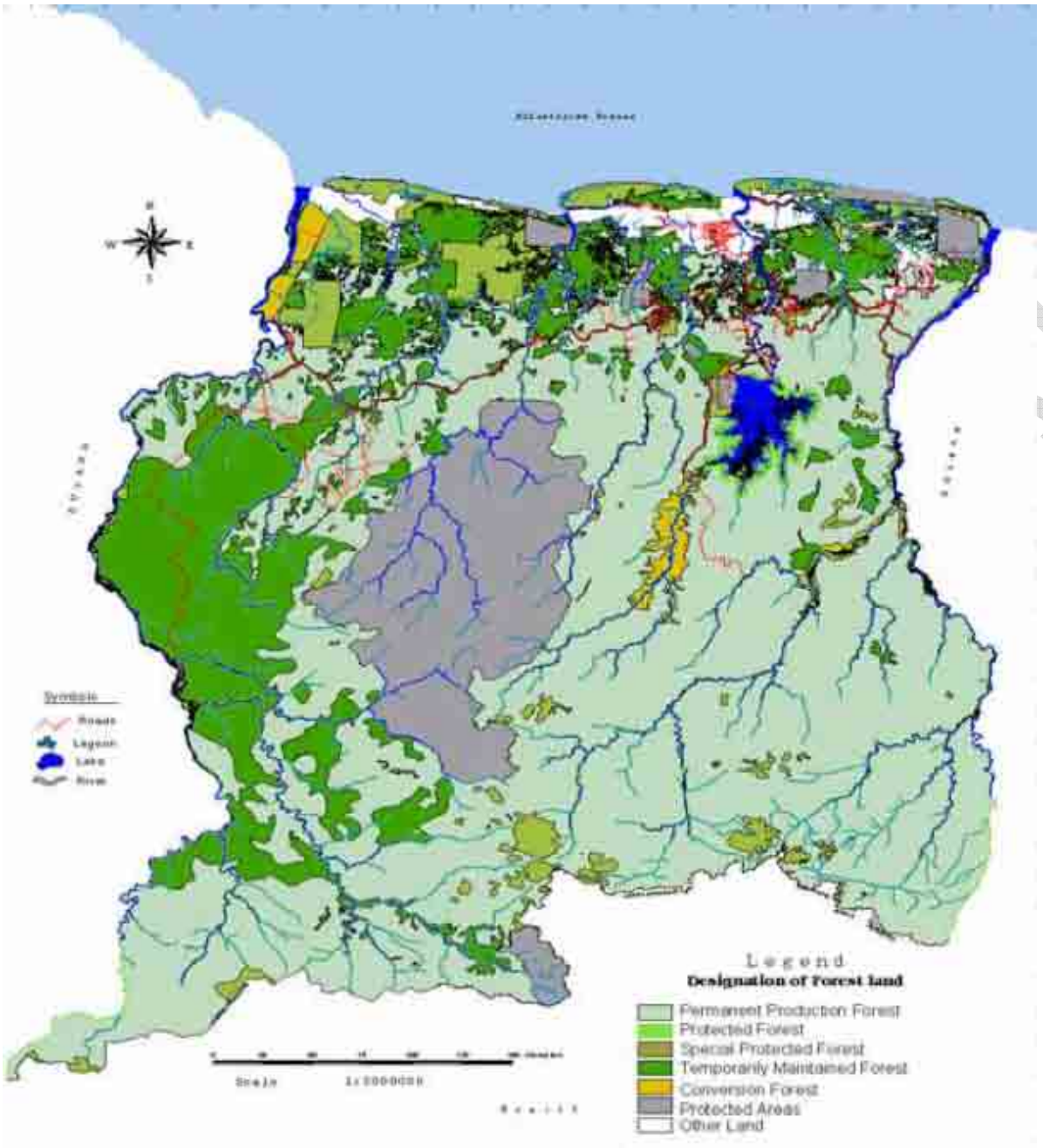
Map 3. Mining concessions in Suriname.



Map 4. Status of mining activities in Suriname.



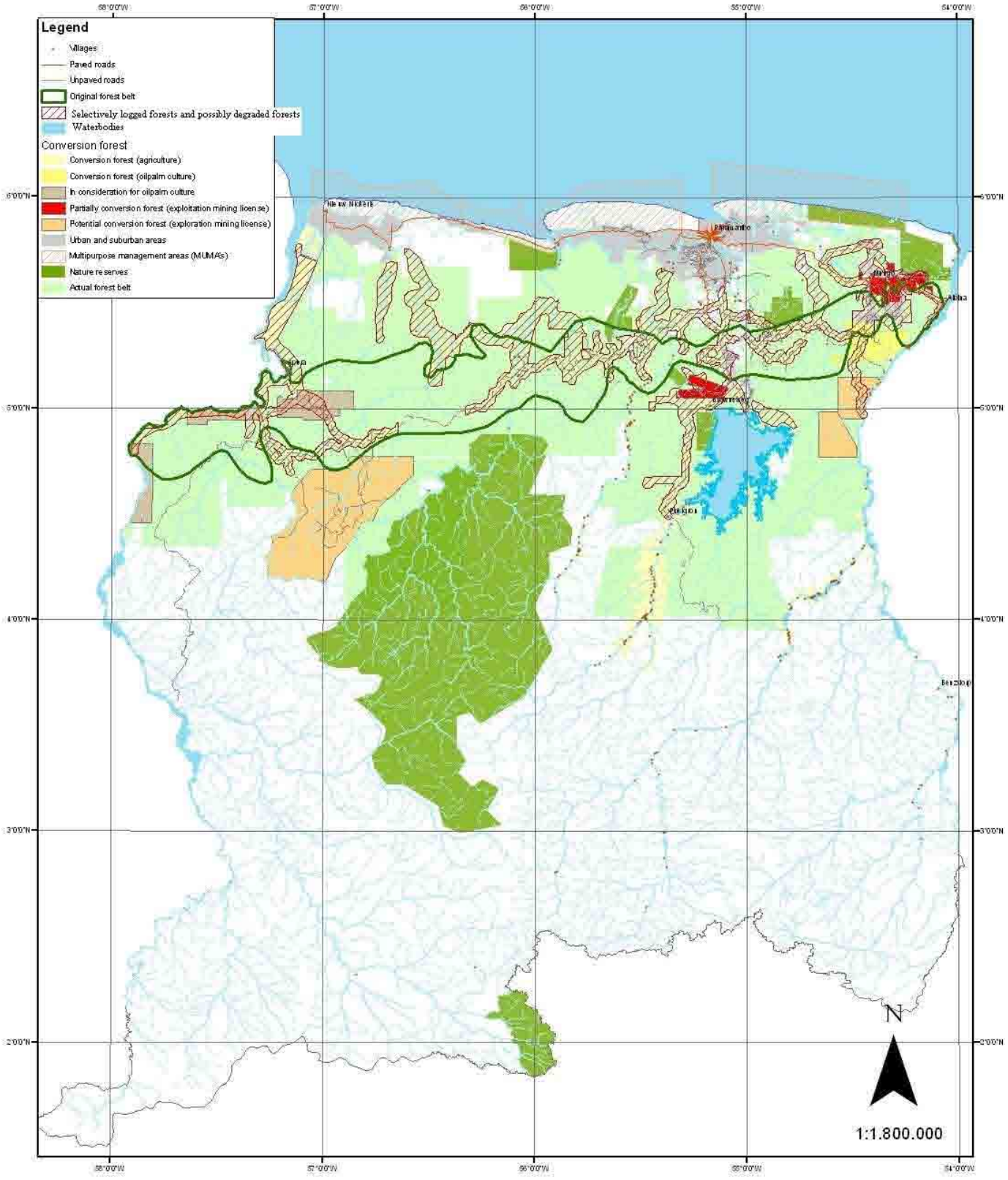
Map 5. Indicative Forest Classification Map of the Republic of Suriname.



Map 6.

REPUBLIC OF SURINAME
Ministery of Physical Planning, Land- and Forest Management

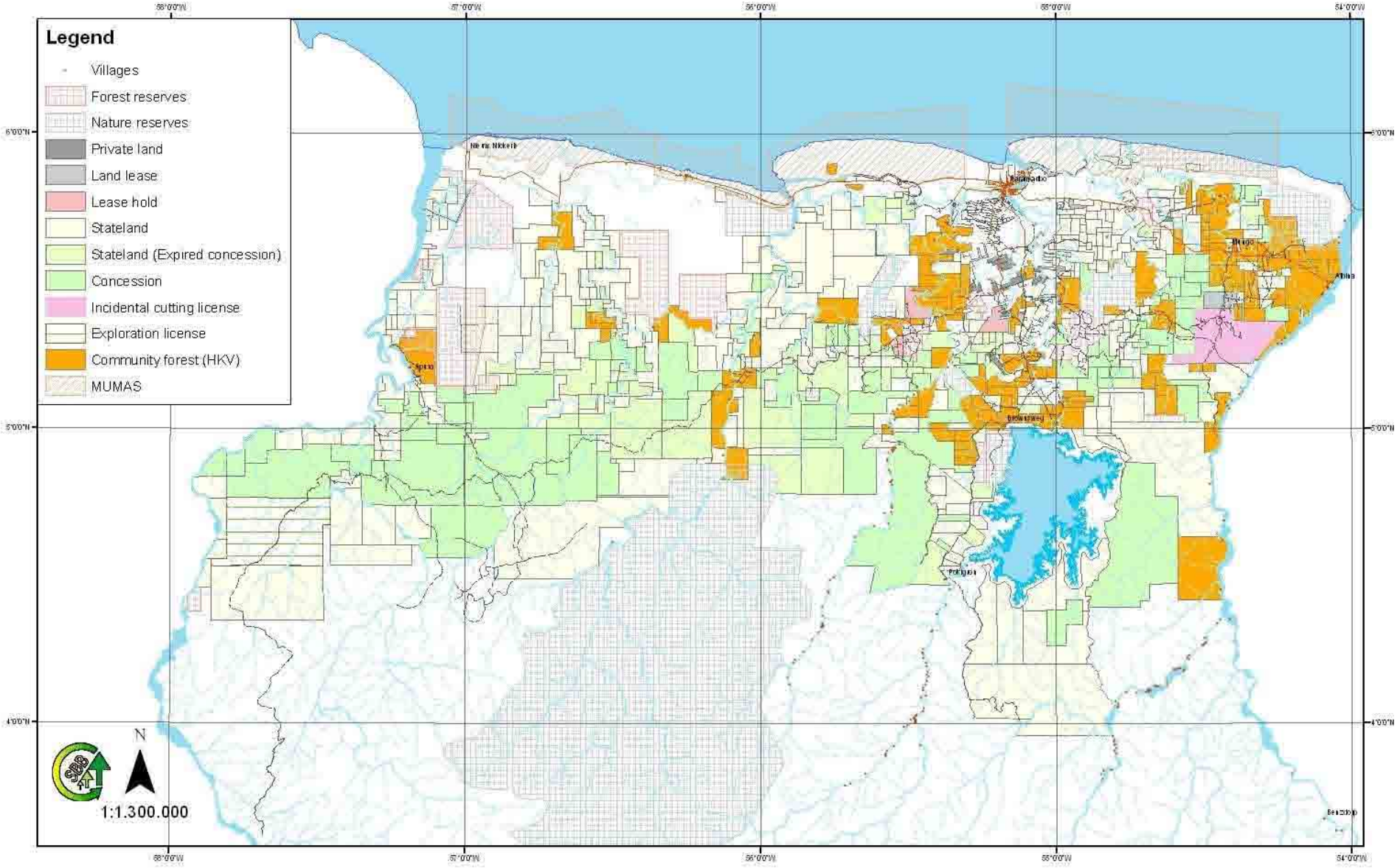
Preliminary indication of the selectively logged forests and the possibly degraded forests



Datasources: Narena (CELOS), Ministery of Physical Planning, Land- and Forest Management (ROGB), Foundation for Forest Management and Production Control (SBB)
Only the mining licenses issued to the major mining companies are displayed.

Map 7.

REPUBLIC OF SURINAME
Ministery of Physical Planning, Land- and Forest Management
Overview of the Timber cutting licenses (december 2008)



Datasources: Narena (CELOS), Ministery of Physical Planning, Land- and Forest Management (ROGB), The Foundation for Forest Management and Production Control (SBB)

Annex 4: General Readiness Plan Activities

Readiness Plan Components	6 months	Year 1	Year 2	Year 3
Formulation of the Redd Strategy/Redd Readiness Plan				
Organize project team, steering committee, etc. and discuss procedures for further planning, preparation, formulation and administration				
Stakeholder meetings				
Develop and implement a general awareness plan on issues of REDD, Climate Changes and Carbon projects				
Develop and implement a capacity building plan for decision makers on issues of REDD, Climate Changes and Carbon projects				
Technical Strengthening: Methodology and Measurement				
Assessment of historical emissions from deforestation				
Assessment of historical emissions from degradation				
Projection and modeling of future emissions from deforestation				
Projection and modeling of future emissions from degradation				
Create land use map				
Update biomass field estimates across all land-uses including deforestation and degradation				
Create a national-level carbon methodology that includes project-level activities				
Develop carbon, biodiversity and social criteria and spatially-explicit dataset to target incentives to the highest outcome potential				
Establish national-level permanent biomass monitoring plots representative of all geographic regions and forest types, and create monitoring plan and protocol				
Develop and implement a capacity building plan for biomass monitoring				
Develop and implement a capacity building plan for GIS and remote sensing				
Create an international platform to integrate monitoring data at the national level				
Increase engagement in UNFCCC SBSTA and other key meetings to build support for Suriname baseline and methodology				
Facilitate meetings with other countries to exchange experiences on remote sensing and monitoring plans				
Demonstration Initiatives				
Determine structure for implementation of pilot activities, including administration, funding and implementation				
Community outreach, communication and				

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education on climate change, carbon project design and REDD incentives				
Undertake capacity building for carbon and pilot project activities				
Facilitate study tours with other counties to exchange experiences on potential field demonstration projects				
Establish clear criteria for evaluation and selection of pilot projects				
Identify pilot activity candidates and make selection based on criteria				
Develop and implement capacity building plan for field teams and local partners to implement pilots				
Define and launch initial pilot projects, to be used as demonstration projects				
Implement permanent site level monitoring plots, monitoring plan and methodology				
Define and implement socio-economic monitoring plans and methodology				
Analysis and testing of alternatives that address each deforestation and degradation driver (slash-and-burn agriculture, illegal logging)				
Integration of REDD and broad land use planning into rural and community development plans				
Governance and Financial Structure				
Strengthen SBB and other agencies including NIMOS, GMD, GLIS, CELOS amongst other related to climate change and forest carbon, monitoring				
Develop and implement capacity building plan for government agencies on issues related to climate change and forest carbon				
Collaborate with government agencies working to clarify land tenure arrangements				
Review and clarify carbon ownership across different tenure and management options				
Implement national and project-based carbon accounting and registry capabilities				
Develop institutional frameworks including a carbon marketing and negotiating unit especially in effectively including Suriname as HFDL country in the REDD and Post Kyoto Negotiations				
Creation of transparent benefits sharing arrangements for targeted financial incentives for REDD				

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