NATIONAL REPORT STATE OF UNCCD IMPLEMENTATION IN SURINAME









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BACKGROUND

The total land area of Suriname is 163,840 square kilometres. Some 90 % of the total land mass of Suriname is covered with tropical rainforest. Unsustainable use of the natural resource forest, as a consequence of excessive forest exploitation, uncontrolled forest land conversion to other land uses such as shifting cultivation (slash and burn), and mining can cause therefore severe degradation of the natural environment.

However, due to low population density, especially in the most vulnerable areas, land degradation is so far limited to less than 4 percent of the total land area. The deterioration of the land qualities caused by land degradation is mainly due to:

- a. the development of hydropower;
- b. the mining of gold and bauxite;
- c. the exploration of crude oil;
- d. the exploitation of sands and
- e. the shifting cultivation, mainly in The Interior Uplands.

It has to be noted that the development of the hydropower plant in the Brokopondo area in Suriname was coupled with the inundation of 1560 square kilometres of pristine forestland, causing first of all loss of cultural heritage, besides loss of a huge volume of extractable wood species, loss of wild life habitat and consequently land degradation.

Moreover mining activities have created already approximately 100 square kilometres of outmined areas, i.e degraded land awaiting rehabilitation. Some other 1200 square kilometres vegetated land is converted to agricultural land. The total forest conversion area due to shifting cultivation is estimated to be some 2500 square kilometres. Based on the aforementioned data the total degraded land area in Suriname is some 5360 square kilometres, i.e. 3.2% of the total land area.

Land degradation and loss of biodiversity, inclusive wildlife habitat still come from mining, especially small-scale gold mining, and shifting cultivation on vulnerable soils in the interior. Most fortunately, timber logging is largely still based on sustainable management practices, especially

due to provisions put in place by the GOS, such as the enactment of the forest management law of 1992, the establishment of SBB and the recent formulation of the forest policy.

Major threats of land degradation, however, can be expected of the potential bauxite mining activities on the susceptible soils in the East and the West of Suriname, if not managed according to relevant existing and new environmentally sound technologies.

Appropriate notice is also needed in this regard for cross cutting issues due to linkages between:

- 1. land degradation and climate change (loss of land due to coastal erosion);
- 2. land degradation (salt intrusion, flooding) and poverty;
- 3. land degradation and biodiversity (loss of wildlife habitat and forest, due to unsustainable forest exploitation);
- 4. land degradation and water pollution and human health (especially mercury pollution and water turbidity caused by gold mining);
- 5. use of agro-chemicals, human health and disturbance of the food chain of wildlife and fish population;
- 6. poverty and loss of biodiversity (excessive hunting, over fishing and poaching) and
- 7. climate change and biodiversity.

Biophysical baseline information on DLDD

Climate

Suriname has a Tropical Rainforest Climate. Its climate is largely controlled by the passage of the Inter Tropical Convergence Zone (ITCZ) above the region.

According to Köppen's climate classification three types of climate can be distinguished. During the year, the rains are not evenly distributed over Suriname.

The major part of Suriname has a Tropical Rainforest Climate (Af; mean monthly rainfall of more than 60 mm) or a Tropical Monsoon climate (Am; one or more months have less than 60mm rainfall). Only in a narrow stretch along the coast in an area in the Southwest of the country an Aw (wet and dry) climate is found.

Rainfall

According to the Meteorological Department (METEO) of the Ministry of Public Works (OW) two rainy and two dry seasons can be distinguished (see table 2)

Table 2: Dry and Rainy Seasons			
Season	Starting		Ending
Short Rainy Season	Early December	-	Early January
Short Dry Season	February	-	End April
Long Rainy Season	Early May	-	Mid August
Long Dry Season	Mid August	-	Early November

Figure 4 illustrates the distribution pattern of the rainfall on the land area.



The seasons are not as regular as indicated above. In particular the Short Rainy Season and the Short Dry Season show a considerable variability in rainfall, which has resulted in either prolonged wet periods (absence of Short Dry Season) or prolonged dry periods (absence of Short Rainy Season).

Temperature

Mean daily air temperature is 26.7 ° C, with an annual range of about 2 ° C. February is the coldest month (avg. 25.7 ° C), and October the warmest (avg. 28.0 ° C). Daily temperature fluctuations are much larger – on an annual basis the mean daily minimum temperature is 21.9 ° C and the mean maximum is 31.9 ° C. The highest mean daily maximum temperature (34 ° C) is recorded in October and the lowest mean minimum temperature (20.5 ° C) in January.

According to Suriname's Initial National Communication to UNFCCC (2004) the mean annual temperature for the capital Paramaribo, over the last 25 years has risen with more than 0.5oC, as illustrated in figure 5.

Figure 5: Mean annual temperature in Paramaribo



Figure 5: Mean annual temperature in Paramaribo Source: Suriname's Initial National Communication to UNFCCC (2004)

Humidity

Humidity averages about 80 – 90 percent annually in the coastal regions whilst in the central and southern regions daily air humidity is lower and averages about 75 percent. The relative humidity closely follows the seasons, with the highest mean daily humidity in the rainy seasons (80-84%) and the lowest in the dry seasons (74-78%). During the night, the relative humidity may reach about 95%, while some hours in the afternoon it drops to 68% in June and to 53% in October. The high relative humidity may lead to hazy conditions and sometimes even fog during the late night and early morning. This is particularly the case in the period October-January.

In the forest area air humidity depends, among others, on the penetration of sun radiation.

Wind

On the Beaufort scale the mean wind speed is 1.3. During the dry seasons maximum mean wind speeds may occur attaining to1.6 Beaufort. In the rainy season however we are dealing with minimum mean wind speeds of 1.0 Beaufort. According the Technical Report 4 of the Project Country Study Climate Change Suriname the wind speeds is generally 3-4 Beaufort during the day in the coastal area, becoming gradually weak to calm during the nocturnal hours, especially in the interior.

Biodiversity

Ecosystem diversity in Suriname is high in many areas, especially those areas where the Coastal Plain, Savannah Belt and Interior are in contact with each other (See table 3). Suriname's enormous biodiversity is relatively well studied for certain groups of organisms. However, large areas of the Interior, including the mountain ranges, remain completely unknown for their flora, fauna, ecosystems and ecological relations.

The number of species of flora and fauna in Suriname is estimated at 670,000. Approximately 9600 are known of which an estimated number of 75 are endemic.

The major natural and man-made ecosystems are presented in Table 3. They are linked to the four main geomorphologic zones (zones I to IV) presented in Table 1.

Table 3: Natural and man-made ecosystems

Source: Forest Sector Environmental Assessment and Action plan (2003).

Geomorpho- logical zones	Natural Ecosystems	%	Area (km²)		
la	 Mangrove forest and other ecosystems of the brackish water area 	1	1,150		
lb, II	Herbaceous freshwater swamps	2			
lb, II	Low swamp forest (swamp wood), including palm swamp forest	3	7,250		
lb, II	High swamp forest and creek forest	2			
lb, II	High marsh forest (seasonal swamp forest)	3	4,700		
III, IV	High dryland forest on lowlands (< 400 m)	80	133,600		
III, IV(a)	High dryland forest on highlands (> 400 m)	3	1		
III, IV	High savannah forest (xerophytic forest)	1	1,850		
III, IV	 Low savannah forest (savannah wood or xerophytic wood) 	1			
II, III, IV(b)	10. Savannah	1	n.a.		
Man-made ecosystems					
lb, II, III, IV	Ecosystems of areas under shifting cultivation, permanent agriculture and animal husbandry, abandoned plantations areas, tree plantations, mining areas, and build up areas	2			
IV	Hydropower reservoir: Lake Brokopondo	1	n.a.		
Total forest are	22	90	148,550		
Total land area		100	164,000		

According to the Forest Sector Environmental Assessment and Action Plan the country is also rich in wildlife, including at least 185 species of mammals, 668 bird species, 152 reptile species, 95 species of amphibians, and 790 marine and freshwater species. Of these 1,890 identified species of vertebrates, approximately 36 species or 2% (mainly freshwater fishes) are endemic to Suriname. The data of the invertebrate fauna is still very incomplete, and inventories routinely reveal many new species.

Socio-economic baseline Information on DLDD

History and politics

The present Surinamese territory was inhabited by several indigenous peoples (Amerindians), long before the Europeans began the colonization of Suriname in the 17th century with the establishment of a plantation economy using slave labour imported from West Africa.

After the abolition of slavery in 1863, European plantation owners contracted labour from China, India, and Indonesia to continue plantation production.

In 1954 Suriname was granted internal self-rule and in 1975 Suriname became independent from the Netherlands. In 1980 a military coup overthrew the elected government followed by an insurgency in 1986 against the military regime led by members of Maroon communities in Eastern Suriname. In 1987 democratic elections were held and Suriname returned to civil rule and elections are held generally every 5 years. The socio-political system is made up of political parties, trade union movements, and NGO's, CBO's, women and youth organizations.

Population

Between the 17th and the middle of the 19th century slaves fled the plantations and created Maroon communities in the hinterland of Suriname.

The Maroons and the Indigenous peoples now live primarily in the Savannah Belt and Interior Uplands in small villages, mainly along the Marowijne, the Cottica, the upper Suriname and Saramacca rivers and to a lesser extent also along the Coppename River. There are also some dispersed concentrations of Maroon communities in the periphery of the urban area of Paramaribo. After the abolition of slavery in 1863, most plantation slaves moved to the capital city of Paramaribo. Currently the Creoles, as their descendants are called, make up 18% of the Surinamese population, whereas the Maroons make up 14% of the population.

The descendants of the contracted labour from India and Indonesia form now 42% of the present Surinamese population: Indians (28%) and Javanese (14%). The rest of the population (24%) is categorized as mixed (13%), others(6%) and not reported(7%) (GBS census 2004).

Recently Brazilians, mainly garimpeiros and their families, have settled in the interior as small scale gold miners. A part of the population, living mainly in Paramaribo, has roots in Europe, the Middle East, Korea, Japan, and the USA.



Currently, about 90 % of the approximately 492,829 inhabitants (Figure.6) of Suriname live in and around the capital city of Paramaribo near the mouth of the Suriname River and in smaller settlements in the coastal lowlands. About 80% of the country is uninhabited

Economic activity

3.3.1. Introduction

Suriname is endowed with a rich natural resource base, especially the so-called renewable natural resources i.e. resources suitable for sustainable economic use, such as forestry, agriculture (horticulture), animal husbandry, water management, etc.

There are also substantial reserves of bauxite, petroleum, gold, granite and other minerals. In addition to this, Suriname has a considerable potential of hydroelectric power.

Source: State of the Environment Report (2000)

Ecological zones	Area in sq. km.	Key economic activity
Ocean Zone	75,000	Navigation
Continental Shelf	65,000	Fisheries
		Navigation
		Oil exploration/exploitation
Young Coastal Plain	10,000	Urban development
		Industry
		Agriculture
		Oil distribution, exploration & Refinery
		Construction Materials Mining
		Forestry
		Energy
		Hunting
Old Coastal Plain	10,000	Bauxite mining
		Forestry
		Hunting
Savannah Belt	10,000	Forestry
		Construction Materials Mining
		Hunting
Interior	136,000	Hunting
		Gold mining
		Bauxite mining (proposed in Nassau, Bakhuys, & Lelygebergte)
		Energy (Brokopondo reservoir)
		Forestry

The focus and backbone of the socio-economic dynamism, however, is situated in the coastal zone of Suriname. The major part of the various economic activities in production, manufacturing, horticulture, agriculture, financial and banking services, and government (public) services are located here.

The development of one of the main economic sectors, i.e the agricultural sector is nowadays confronted with infrastructure problems, availability of finance, supply of equipment, lack of management, and foreign market access.

Moreover high nominal interest rates as well as exchange regulations adversely affect the sector. As a consequence hereof the importance to the economy of the other sectors, e.g. the bauxite sub sector has increased.

State of Land Degradation

Definition of land degradation

According to Article 1 of the Convention ("Use of Terms") desertification is defined as "land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors, including climatic variations and human activities." Land degradation is described as " the reduction or loss, in arid, semi-arid and dry sub-humid areas, of the biological or economic productivity and complexity of rainfed cropland, irrigated cropland or range, pasture, forest and woodlands resulting from land uses or from a process or combination of processes, including processes arising from human activities and habitation patterns, such as:

- 1. soil erosion caused by wind and/or water
- 2. deterioration of the physical, chemical and biological or economic properties of soil;and
- 3. long-term loss of natural vegetation."

Suriname has, as stated in chapter 2.4 a Tropical Rainforest Climate according to Köppen's climate classification; considering the definition as phrased in article 1 of the Convention in relation to the prevailing climatic condition in Suriname may lead to the conclusion that Suriname has nothing to do with desertification and land degradation and the consequences thereof.

The Global Environmental Facility (GEF), however adopts a narrower but more operational definition of land degradation. It defines land degradation as: "any form of deterioration of the natural potential of land that affects ecosystem integrity either in terms of reducing its sustainable ecological productivity or in terms of its native biological richness and maintenance of resilience." In view of the above cited GEF explanation and the existing physical and socioeconomic realities in Suriname land degradation does occur in Suriname.

The negative impact on land (land in the sense of Article 1 of the Convention) due to economic activities such as unsustainable agriculture practices, forest exploitation and exploitation of mineral resources can generally be considered as land degradation in Suriname. In other words non sustainable land use practices cause land degradation.

In order to contribute to the objective of the Convention and to implement the obligations under this convention a first step to be taken is to promote awareness with regard to land degradation and the affects thereof. All stake holders, inclusive decision makers and technicians have to be involved in this process. One of the key issues is to promote sustainable land management.

First of all an enabling environment has to be created for the implementation of a sustainable land management and land use policy. Sustainability is the result of the interaction of several forces and factors such as development objectives, social ambitions, and environmental characteristics among others. So the definition of sustainable management (SLM) can differ because of the differing importance laid upon the various factors. The FESLM Working Party (Framework for Evaluating Sustainable Land Management), of the FAO (Nairobi;1991) defines sustainable land management as follow:

Sustainable land management combines technologies, policies and activities aimed at integrating socio-economic principles with environmental concerns so as to simultaneously:

- maintain or enhance production/services (Productivity,)
- reduce the level of production risk (Security)
- protect the potential of natural resources and prevent degradation of soil and water quality (Protection)
- be economically viable(Viability)
- and social acceptable (Acceptability)

The incorporation of the five objectives in the formulation of a sustainable land management and land use policy has to be considered profoundly.

Historical overview of the causes of land degradation in Suriname

Before the arrival of the European colonists in the 17th century Surinamese territory was inhabited by several indigenous peoples (Amerindians). The communities in the coastal area and in the interior were living rather separately from each other, each with its own particular mode of "production", social organizations and cultures. It is assumed that in those days Suriname's biodiversity stayed untouched, say up to 90%. With the arrival of the Europeans the colonization of Suriname started and a transition from a largely subsistence economy to a cash economy took place. Large areas of pristine forestland were cleared for the establishment of plantations, first in the coastal zone and later upstream the rivers Suriname and Commewijne. The aim was to gain maximum profits out of agricultural production. Environment aspects were not considered at that time. This can be marked as the first step of land degradation in Suriname.

After the abolition of slavery in 1863, most plantation slaves moved to the capital city of Paramaribo and to continue plantation production the colonists were obliged to contract labours from China, India and Indonesia. Due to absenteeism of plantation owners, decreasing market prices for agricultural products and mismanagement agricultural activities became less profitable. The colonial government then began planning the development of Suriname to the neglect of agricultural development and the focus on the exploitation of natural resources, mainly bauxite and forest.

The mining of bauxite started in 1926. In 1958, the Aluminum Company of America (Alcoa) which mined bauxite in Suriname, signed the Brokopondo Agreement with the government to develop a hydropower plant.

Intensive forest activities started in the 50s, when a Dutch logging company, Bruynzeel, obtained concessions for wood logging.

To enhance the development of the natural resources the government started large scale explorations of forest and mineral resources. This required the opening up of large areas of the interior, which was made possible by constructing roads and airstrips.

Forestland had to be converted to other land uses. Sustainable development was not yet a topic in those days, so decision makers were not aware of the steady encroachment of land degradation.

Due to the increase of awareness with regard to the negative impact of unsustainable use of natural resources, nationally and internationally, the government is now focusing on the implementation of an integrated national environmental policy in order to incorporate it in the sectoral and national

development objectives. The realization of the environmental legislation is in this regard a prerequisite to solve environmental disputes efficiently and effectively.

Identification of main areas affected

As stated above sustainable land management and land use are the basics to combat land degradation and to mitigate the consequences of earlier bad practices with regard to land allocation and land use.

Land degradation is the outcome of both natural factors, such as rainfall and hill slopes among others as well as anthropogenic influences such as changes in land use and the application of inappropriate methods with regard to the use of natural resources. The phenomenon of land degradation and its magnitude in Suriname is not so severe yet, considering the natural conditions of Suriname. It is however a problem to be aware of.

Due to lack of relevant and up to date data concerning land degradation, the following is a straightforward indication of the extent.

According to table 1 Suriname is subdivided in four geomorphological zones. Nearly in every zone there are areas affected by land degradation due to social and economic activities.

The expansions of rice fields and withdrawal of freshwater, together with the mining of sand and shell ridges poses a serious threat to the ecosystem of the Young Coastal Plain. The exploitation of crude oil also has a negative impact on these fragile ecosystems. Other forms of agriculture, forestry and urban development are also activities that may cause serious disruption of the natural environment.

In the Old Coastal Plain we are confronted with bauxite mining and forestry. The bauxite mining operations requires conversion of large areas of forest land as well as the removal and or reallocation of huge amount of soil material.

Mining of construction material and forestry are the threatening activities in Savannah Belt, while the hilly and undulating Interior Uplands are areas susceptible to land degradation due to activities as forestry, shifting cultivation, gold and bauxite mining, access road construction, and energy generation.

Investment Patterns: Barriers and Opportunities for UNCCD implementation

A major constraint in project preparation and project execution in developing countries is funding. Finding the necessary financial resources for the implementation of projects is often a time consuming and some while a frustrating activity. Significant funding will be required for the further preparation and subsequent implementation of the National Action Program. The following possibilities have to be explored:

Local

- 1. Budget of the Government (Line ministries concerned with matters of the environment)
- 2. Possible private sector sources
- 3. Co-operating with NGOs in the area of financing.

International

- 1. Accessing funds from relevant agencies including UNCCD, GEF, UNEP, and the UNDP.
- 2. Co-operating with traditional donor partners including Canada, IADB, IsDB, EU and NHAS

The allocation of resources of the national budget for activities related to UNCCD such as activities that promote sustainable land use and management is necessary to be considered by the Government.

The possibility of the introduction of an environmental tax and the foundation of a national environment fund has to be explored.

Expansion of the co- operation scope with the relevant international agencies and the promotion of co-operation between local and international NGOs for the implementation of specific projects have also to be elaborated.

RECCOMMENDATIONS

Suriname stands a great chance in benefitting from UNCCD implementation but a number of policies need to be put in place. Most of the laws are either not clearly defined or outdated. Prompt measures need to be put in place to address this situation which is gravely affecting the country's chances of benefitting from implementing agencies such as UNCCD. To secure continued progress in the implementation of UNCCD in Suriname, the following **recommendations** should be considered:

- 1. Increase the awareness of potential investors on the importance and long term benefits of land degradation neutrality.
- 2. Create linkages with various Ministries, Departments and Agencies to allow for the sharing of and easy access to information regarding UNCCD implementation and progress in Suriname.
- 3. Formulate monitoring and co-ordinating mechanisms for implementation of UNCCD especially at the local level.
- 4. The formulation of a UNCCD committee to ensure monitoring and follow-up process in the implementation of UNCCD in Suriname.
- 5. Increase efforts at the community level to re-socialise individuals and achieve cultural changes in unsustainable practices which counter land degradation neutrality.
- 6. Increase collaboration between Ministries, Departments and Agencies involved in climate change adaptation and disaster risk reduction.
- 7. Align agricultural practises to support the achievement of land degradation neutrality (for example climate smart agricultural practises).

- 8. Establish, implement and coordinate land-use planning to avoid or minimise fragmentation and damage to ecosystems.
- 9. Increase efforts to rehabilitate forest reserves and estates in upper watershed area and along river courses.
- 10. Increase expertise and technology needed to capture and interpret information on land resources and the impact of climate change.
- 11. Soil Care Project by the Caribbean community.