

BACKGROUND STUDY FOR THE NATIONAL REDD+ STRATEGY OF SURINAME



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**BACKGROUND STUDY
FOR THE NATIONAL REDD+ STRATEGY
OF SURINAME**

PUBLISHED BY:



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PLEASE CITE AS FOLLOWS:

AAE (2017). *Background study for the National REDD+ Strategy of Suriname*. Paramaribo, Suriname.

ACKNOWLEDGEMENTS:

This Background study for the National REDD+ Strategy for Suriname has been prepared by the consultancy firm Asesoramiento Ambiental Estratégico/ Strategic Environmental Advice (AAE) for the National Institute for Environment and Development in Suriname (NIMOS). The authors wish to thank all the stakeholders who have contributed to this document, especially the staff of the REDD+ Project Management Unit (PMU), the Foundation for Forest Management and Production Control (SBB) and NIMOS. The SBB in particular played a significant role through the staff of its Forest Cover Monitoring Unit (FCMU) who produced the scenarios presented in section 3 in close collaboration with the consultant from AAE and with stakeholders from several institutions in Suriname. A scenario development training was held and stakeholders participated actively with data and staff time. Section 4 includes a more detailed description of the stakeholder engagement and we thank everybody who was involved in the process.

DISCLAIMER:

The content of this report does not necessarily reflect the official policy or position of any agency of the Government of Suriname. The purpose of the study is to feed the REDD+ readiness process with background information that will be used when developing the National REDD+ Strategy for Suriname. Views and opinions expressed in this report, as well as assumptions made within the analysis, are those of the consultants or their informants and should not be seen as definite facts.

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1. INTRODUCTION AND CONTEXT

Suriname and REDD+

REDD+ (Reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks) as a concept has been developed under the United Nations Framework Convention on Climate Change (UNFCCC), recognizing the potential role of forests to mitigate climate change. REDD+ is a framework intended to provide financial rewards to developing countries, as a means to make the protection of natural forests more economically attractive than converting land to other uses.

REDD+ activities include reducing emissions by avoiding deforestation and forest degradation, and enhancing the role of conservation, sustainable management of forests and the enhancement of forest carbon stocks.

The UNFCCC has defined three stages of progress towards REDD+ implementation.¹ During the first preparatory phase, the focus is on readiness, meaning capacity building and policy deployment at the national level. The second phase focuses on putting into practice policies and pilot projects. Finally, a third phase of full implementation enables a country to get payments for results obtained by implementing REDD+ activities.

This National REDD+ Strategy is developed at a time when Suriname finds itself in an advanced stage of phase 1, the Readiness Phase, scheduled to run from 2014 to 2020. Overall engagement in REDD+ started already in 2008-09, when Suriname decided to apply for support from the Forest Carbon Partnership Facility (FCPF), an initiative that assists countries in their REDD+ preparations by providing them financial and technical assistance.

During readiness, a number of studies were undertaken addressing, inter alia: the drivers of deforestation in Suriname; the emissions factors; and the evolution of historical deforestation. A roadmap towards the development of a national forest monitoring system has also been developed, among other elements. These studies and diverse elements constitute the basis for the development of the REDD+ National Strategy.

Forest in Suriname

93% of Suriname's territory is covered by about 15.3 million hectares of forests, and the country has a relatively low deforestation rate of in average 0.05% annually for the period 2009-2015 (SBB, 2017). Characterized as a high forest cover and low deforestation (HFLD) country, Suriname can benefit from REDD+ to support its sustainable development, while protecting its rich forests.

Suriname lies just above the equator between 2° and 6° N and 54° and 58° W; it has a typical tropical moist climate with a daily average temperature of 27.5 °C. Mean annual rainfall ranges from 1500 mm on the coast to 2500 mm in the higher Central and Southern areas of the country. According to the data on the forest cover of 2015 and the data on the average carbon stock per ha generated by the National Forest Monitoring System, Suriname's forest stores at least 12,200 million t CO₂.

The high dryland forests of the interior lie on well drained soils and cover vast parts of the internal region, of low mountain ranges on the south, and of the plateaus of the coastal plains and the loamy sands of the Savanna belt. These seasonal evergreen forests occupy approximately 80% of the country and vary in species composition, with occasional dominance of single species (Mohren and van Kanten 2011).

¹Although there are indications that preparations for REDD+ is a continued, non-linear and gradual process.

Low swamp forests, covering about 3% of the country area, are found on the young coastal plains, with Holocene soils of mainly clays with some beach ridges. Tall swamp forests mostly occur on the old coastal plain, with Pleistocene soils of clay and fine sands and occupying 2% of the land area. The Zanderij formation is also a part of the coastal zone and runs east-west to the south of the coastal plains, it is characterized by the presence of white sand deposits and contains areas of forest and savanna vegetation. This formation tapers from about 100 km wide in the west to about 40 km wide in the east.

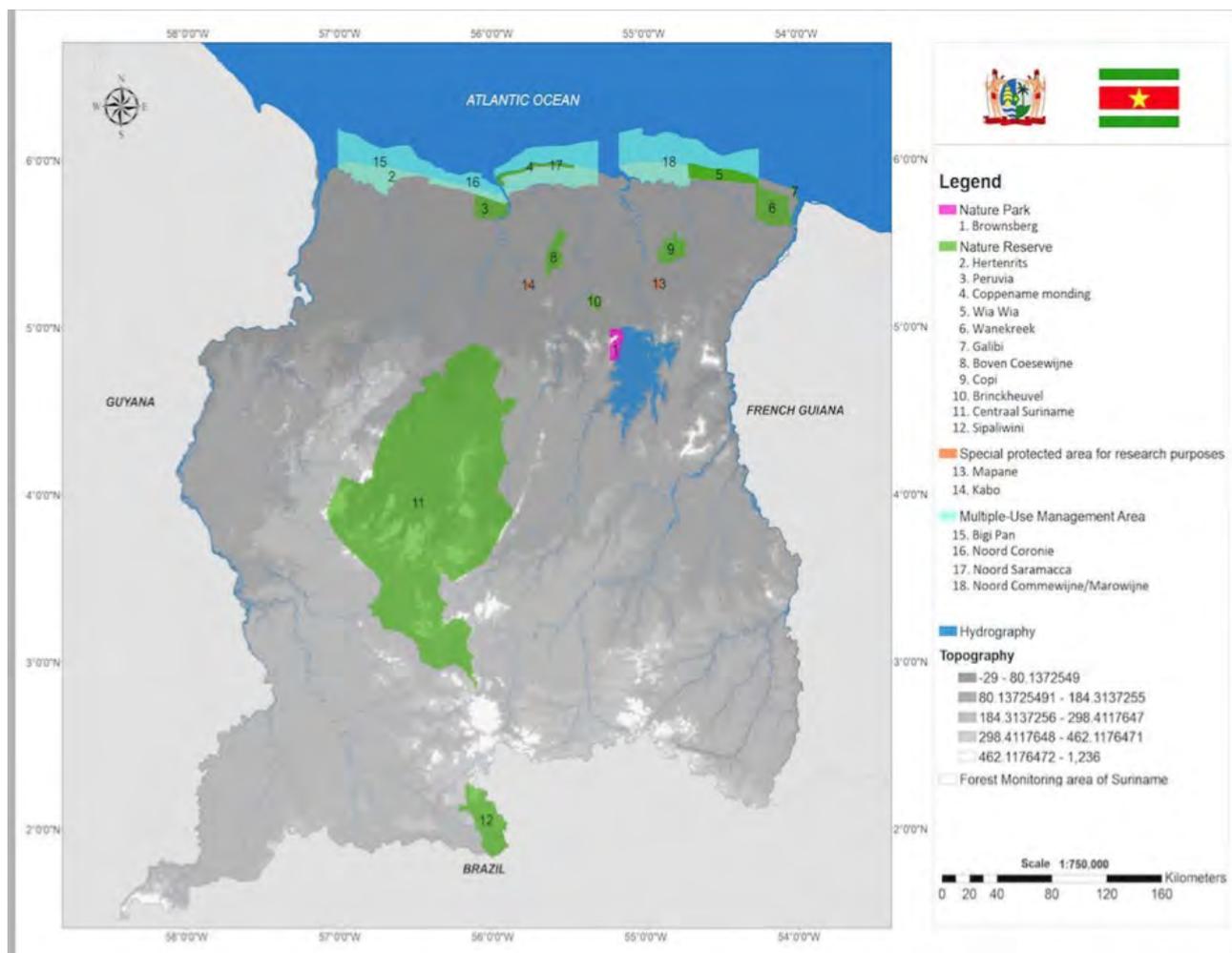


Figure 1. Overview of Protected Areas in Suriname. Source: SBB elaboration 2017

Over 2 million hectares of forests and forests ecosystems are protected in 16 protected areas in Suriname (see figure 1). They cover approximately 13% of the land surface of Suriname. Almost the entire coastal area of Suriname is protected in Multiple Use Management Areas (MUMAs). Such areas are consecrated to the protection of wildlife, such as endangered shore birds and sea turtles.

The Central Suriname Nature Reserve (CSNR), a 1.6 million ha of pristine rainforests is located in the center of Suriname. The CSNR protects both montane and lowland primary tropical forests, a large population of both aquatic and terrestrial species – including endangered ones, and the Coppename River Basin, a main source of good quality water. Remarkably, the CSNR has been included in the World Heritage List of the UNESCO.

Land use change and drivers of deforestation

Historical and recent land use change

Historically, the most important land use change factors were urbanization, mainly in Paramaribo and greater Paramaribo (Wanica and Commewijne), together with large infrastructure developed along the main roads connecting east and west, and north-south. Agriculture of large plantations alongside rivers was another major source of land use change.

National deforestation and the drivers of deforestation since the year 2000 has been monitored using remote sensing technology². The Forest Cover Monitoring Unit (FCMU) in the Foundation for Forest Management and Production Control (SBB) assesses the forest cover and the drivers of deforestation in Suriname. Maps using technology that allows for timely updated information on forest cover were developed. Such maps use Landsat images (Landsat 5, 7 and 8) and a methodology adjusted to national circumstances that is comparable to the PRODES-methodology used by the Instituto Nacional de Pesquisas Espaciais (the Brazilian Space Agency) for tracking forest cover in Brazil. Activities to enhance the monitoring of forest cover in Suriname have been supported by a project led by the Amazon Cooperation Treaty Organization (ACTO) to enhance the monitoring of the forest cover in the Amazon Region.

Information from these sources and the deforestation maps show high intensity of deforestation in the Greenstone belt. Changes occurred between specific areas (hotspots) during the period 2000-2015. The hotspots during this period were Balingsoela, Meriankreek, Lelygebergte/Sarakreek, Tapanahony river, Benzdorp and Brownsberg.

Annual deforestation rates increased from 0.02% in the period 2000-2009 to 0.05% in the period 2009-2015. The following districts have a higher percentage of deforestation expressed in terms of proportion by district area: Brokopondo (3.4%), Wanica (1.7%), and Para (1.4%).

Most deforestation takes place around the Brokopondo Lake due to the gold reserves existing in the area, which are part of the Greenstone belt. Streams in the area also facilitate the development of alluvial gold mining activities.

Deforestation in the period 2000-2015 equates to 26.4% in the Paramaribo district, 10.2% in Wanica and 4.5% in Brokopondo. The main drivers were urban expansion in Paramaribo, pasture in Wanica and mining in Brokopondo. In Paramaribo and Brokopondo the second main driver of deforestation is infrastructure development, while in Wanica is urban expansion.

²This information is based on Draft Technical report: Forest cover monitoring in Suriname using remote sensing techniques for the period 2000-2015; Forest Cover Monitoring Unit; 2017

Shifting cultivation is considered as a sustainable practice used by indigenous and tribal communities to grow their crops, and it is not seen as deforestation since the forest gets the chance to regenerate. Nevertheless, shifting cultivation is a driver of forest degradation. The exact impact in terms of greenhouse gas emissions has not yet been calculated, so research on this topic is needed. During the period 2000-2009, the area used for shifting cultivation increased. Afterwards, the trend remained stable. Shifting cultivation is common in the upper-basin of the Suriname river, associated to human settlements in the area. Most of the shifting cultivation takes place in the districts Sipaliwini (58.7%), Marowijne (26.2%), Brokopondo (10.2%) and Para (4.2%).

The figures presented below show the intensity of deforestation along different periods of time. The forest cover is monitored on an annual basis, while the mapping of use of the land after deforestation has taken place (post-deforestation LULC classification or the drivers of deforestation) is updated every two years. For the production of the post-deforestation Land Use Land Cover (LULC) classification, the TerraClass method is used. The LULC classes as defined in the Technical Report LULC Maps (SBB, 2017) are Agriculture, Burned areas, Infrastructure, Mining, Others, Pasture, Secondary vegetation and Urban. These mapping activities were carried out in a participatory process including all sector ministries and institutions.

The results show that deforestation rates increased for the period 2000-2015, pointing to mining (especially artisanal small-scale gold mining, ASGM) as the main driver of deforestation. Figure 2 shows the level of intensity of deforestation for different periods in time. It indicates that the highest intensities of deforestation took place in the North-east area of Suriname.

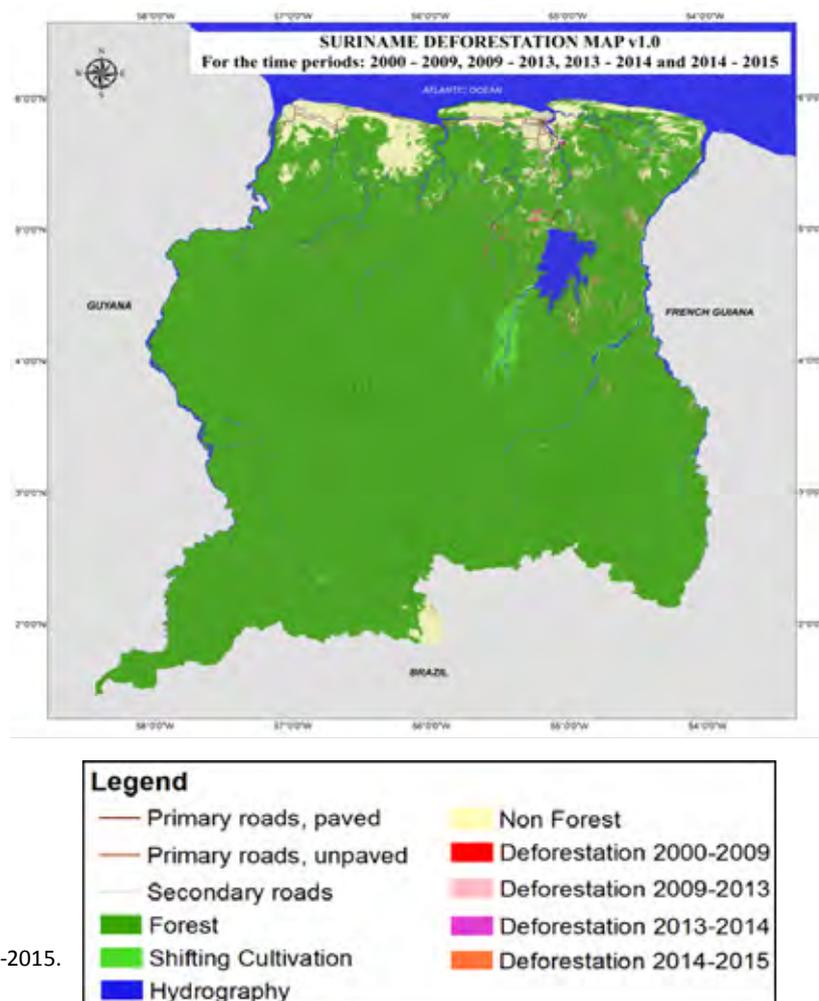


Figure 2. Suriname Deforestation Map 2000-2015.
Source: SBB

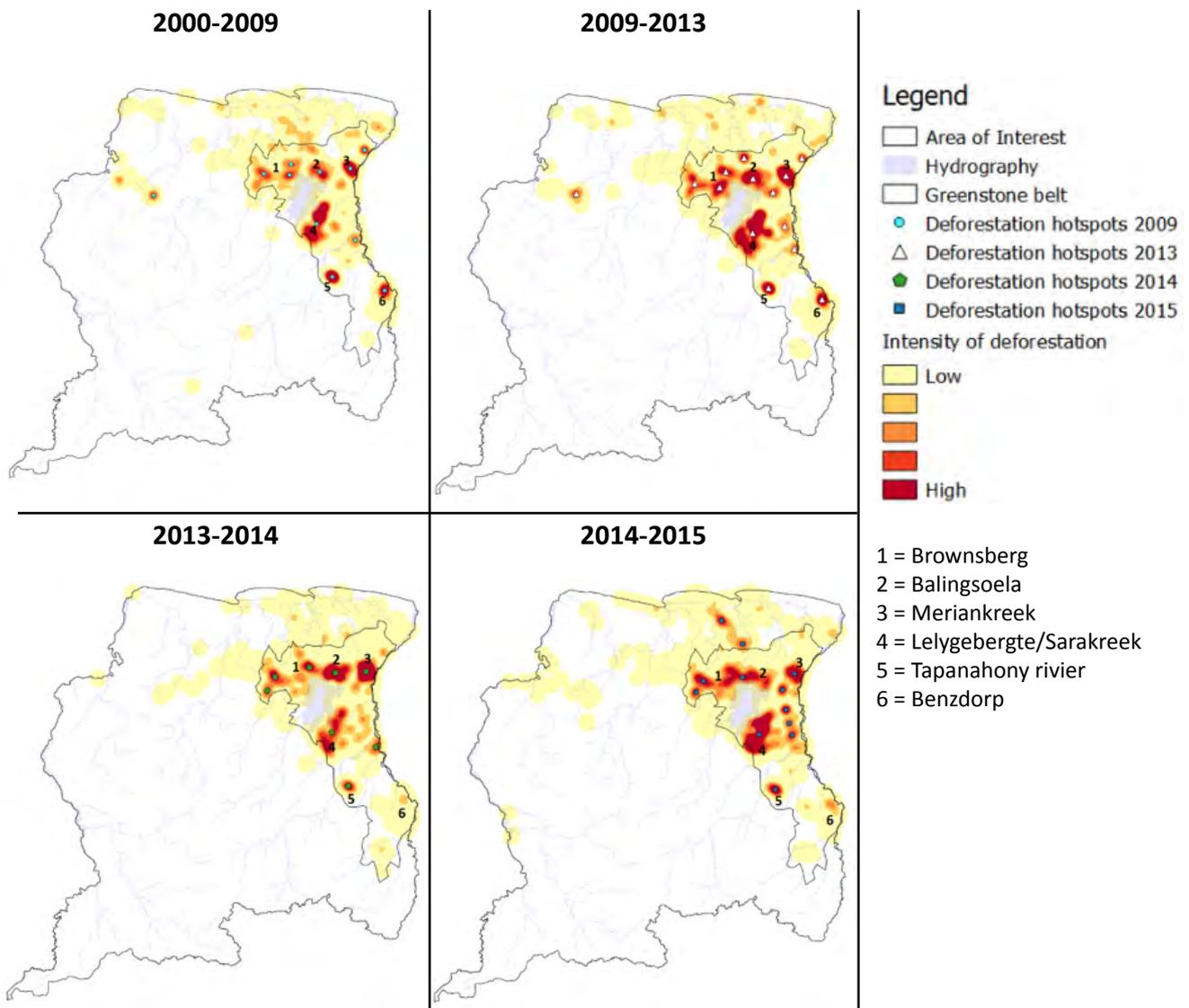
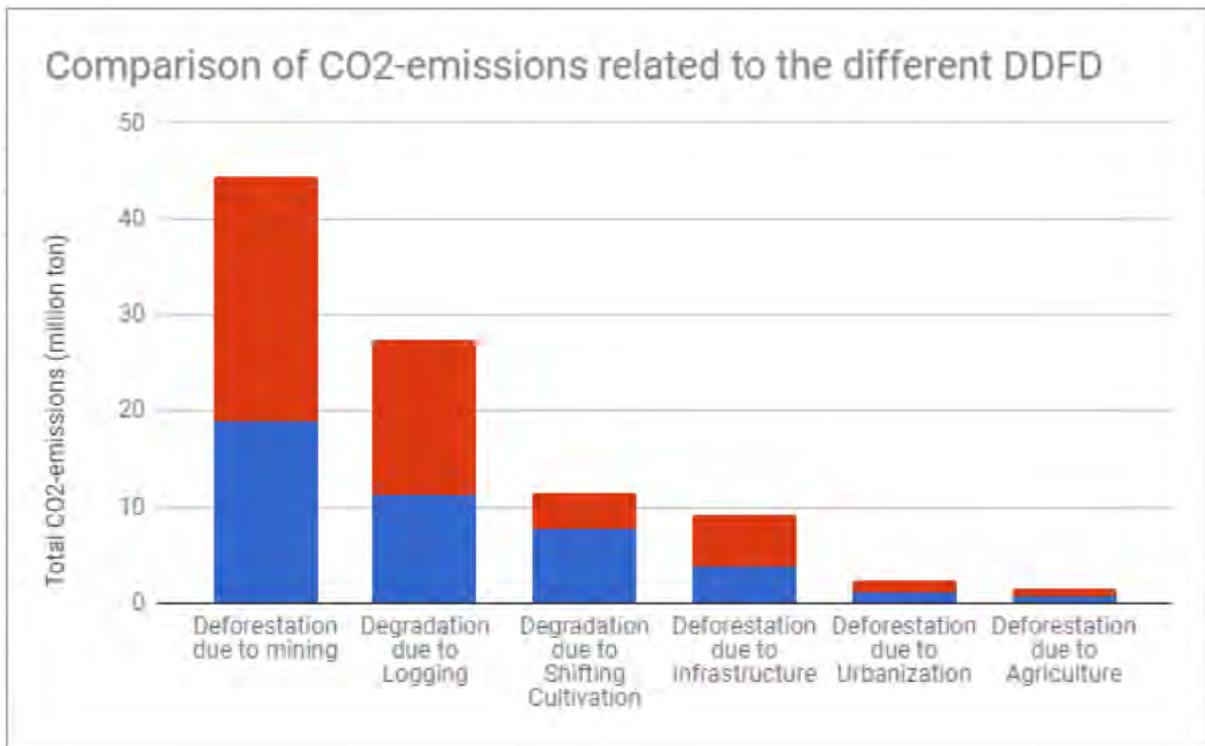


Figure 3. Overview of the level of intensity of deforestation for the periods 2000-2009, 2009-2013, 2013-2014 and 2014-2015.
 Source: SBB 2017

In the period 2000-2009, the deforestation hotspots were mostly located near Balingsoela, Meriankreek, Lelygebergte/Sarakreek, Tapanahony river and Benzdorp. In 2009-2013 the hotspots remained the same, including Brownsberg. However, during the period 2013-2014 the hotspots shifted to Balingsoela and Meriankreek, while the intensity in the Benzdorp area lowered. For 2014-2015, the hotspots were Balingsoela, Meriankreek, Brownsberg, Lelygebergte/Sarakreek and Tapanahony river. See figure 3.

These results indicate that spots of highest intensity of deforestation change over time. Shifts in location can be due to diverse factors, such as improved accessibility, gold detection, access to advanced technology or the return of miners to extract residues of gold from former gold mines (NIMOS, SBB and UNIQUE 2017).



Blue = emissies 2000-2009, Red = emissies 2009-2015

Figure 4. Comparison of CO2 emissions related to different drivers of deforestation and forest degradation.

Source: SBB 2017

Direct and underlying causes of deforestation and forest degradation

The proximate drivers of deforestation or forest degradation are human activities or actions that impact directly on the forests and result in their loss or degradation. These proximate drivers or direct causes are well known in Suriname as existing analyses in the country suggest (GOS 2013, NIMOS, SBB and UNIQUE 2017).

Mining (especially unplanned artisanal small-scale gold mining) has been identified as the chief direct cause of deforestation, followed by infrastructure development, urban development and agriculture. Energy production is not a regular cause of deforestation as it materializes only during the construction of hydropower projects. However, it is expected that energy demand will double by 2030 in Suriname and current national plans anticipate further developments in this sector (GOS 2017). Therefore, energy production is a potentially relevant driver to take into account. The studies suggest that the forestry sector does not contribute to direct deforestation, but forest degradation results from cases of overexploitation or poor logging practices and forestry contributes to 25% of the REDD+ related GHG emissions. The following sections describe the production sectors and highlight the main features of the drivers of deforestation and forest degradation in Suriname.

Forestry

93% of Suriname's land area is covered by forest. Most of Suriname's forests are high dryland forests located in the interior; these are seasonal evergreen forests which cover approximately 80% of the territory. Swamp forests are also located on the coastal plains. These forests fall within the Exploitable Forest Belt, which during the last six decades has held the most important timber production area. The Exploitable Forest Belt is located above 4° N latitude on a 40 to 100 km wide forest zone running east-west; a mesophytic high forest covers the brown sands and loams of this landscape.

Surinamese forestry has a rich and long history, with first attempts to establish a productive forestry sector dating back to 1903 and the establishment of a state forest service a few years later. During the 20th century, forests use and management were influenced by different silvicultural strategies, which were not optimal for the typology of such forests, but a natural consequence of the little knowledge at the beginning of the century on the dynamics of these "new" forests. Dominant political events were also relevant, particularly the end of Colonial rule in 1975 and the inland war in the late 1980s.

In the 1980's, a forest management system best suitable for the Surinamese forests was developed, the polycyclic CELOS Management System. Key concepts developed under this system, together with those of the CELOS Harvesting System (CHS), were later incorporated into a draft Code of Practice for sustainable forest management and utilization. The CHS is the oldest Reduced Impact Logging (RIL) system developed in South America (Werger 2011).

The inland war in the late 1980s had a heavy cost on both public institutions and private logging enterprises. Forest guard stations and related assets were lost, as well as private equipment and infrastructure, and the Forest Service "became almost non-existent in the early 1990's" (Hendriksen and de Graaf, 2011). This bleak institutional scenario, concurrent with an economic crisis, contributed to the granting of large scale and potentially destructive logging concessions in 1993, which covered more than a quarter of the country's area. These actions and implicated environmental and social risks had local and international repercussions. Confronted with social pressures and a growing general concern on the national forests, the national government established in 1998 the Central Suriname Nature Reserve. In the same year, the two main institutions with present-day responsibilities on forest management, that is the National Institute for Environment and Development in Suriname (NIMOS) and the Foundation for Forest Management and Production Control (SBB), were established. It should be mentioned that the SBB was the first step in the process of institutional strengthening and renewal within the forest sector that started in the mid-nineties of the past century. This process will be finalized with the setup of a fully fledged Forest and Nature Authority (BOSNAS), which will have responsibilities of Sustainable Forest Management and Protected Areas Management. Legal and financial preparation of the BOSNAS were carried out and the relevant documents were presented to the President in 2006, to further present it to the National Assembly for approval, but up to today, no further steps were taken. The current Minister responsible for forestry has taken the decision to restart this process and to finalize it with the setup and operation of BOSNAS.

Logging concessions for timber harvesting purposes cover around 1.6 million hectares, communal forests or areas designated for the benefit of the indigenous and tribal peoples in the interior cover 775.800 ha, and other forms of permits for forest exploitation (Incidental Cutting Licenses) cover 168.363 ha (SBB 2016). The Forest Stewardship Council has certified 363.090 ha in the country (FSC 2017).

The annual wood production is increasing in the country. It ranged between 150.000m³ and 200.000m³ from 2000 to 2008, was 580.000m³ in 2016 and reached 860.000m³ in 2017. Most of the exported wood is round wood: 481.000m³ in 2017, against 17.000m³ of sawnwood, the main processed wood product in the country. Plywood is currently produced by one small company (2.000 m³ per year).

Overall, the contribution of the timber industry to the gross domestic product is barely 1.7% and employs 6.000 people. In addition, the recorded harvesting of minor timber products (MTP) is small and their contribution to the overall timber taxation is just about 0.5% (van Dijk 2011, cited by NIMOS, SBB and UNIQUE 2017). However, the actual harvesting levels are suspected to be much higher than existing official records, as many MTP are harvested for subsistence purposes. The MTP are an income source for the members of forest communities. Furthermore it can be mentioned that these products are important input for the agriculture and housing sector. But it is important to take action on the production of the MTP, because it can lead to forest degradation. Planned production of MTP has to be introduced in the forest sector in Suriname. The collection and use of non-timber forest products (NTFP) is also estimated to be significant, but there are no records on this regard.

Timber harvesting and timber production are strongly influenced by the ecology of Suriname forests. In spite of the wide diversity of tree species in Suriname forests, the demand of both local and international markets is limited to few species³. Such limited demand, together with underlying uncertainties and low extraction rates,⁴ has hindered the adequate planning and increased the costs for harvesting. In the past, this has resulted in the implementation of selective logging and contributed to maintaining forests biodiversity. Nowadays, sustainable development in the country needs to foster the marketing of a larger variety of tree species. This could contribute to enhance decision-making on forest management, while supporting the realization of both social and environmental objectives.

The forestry sector in Suriname is today affected by internal as well as extra-sectoral factors. While the government and many companies strive for sustainable forest management, it is not always optimally enforced. Outdated technologies, such as using excavators for skidding the logs, creates unnecessary extra degradation in the forest. Low recovery rates and the export of roundwood result in an undervalorisation of the forest also resulting in additional damage. The Code of Practice, containing operational guidelines that provide procedures of significant silvicultural, environmental and social implications, lack mandatory legal status resulting in limited capability to effect proper control on the forest resource. This adds to a current lack of financial resources, which undermines capacity in a broad sense, since there is a dichotomy between formal policies and the ability to implement them with existing resources. These difficulties have also affected training programmes, as well as the capacity to monitor, supervise and provide guidance to forest operators.

Extensive management or “conventional logging” contrasts with intensive forest management. The latter requires fairly comprehensive planning, applies Reduced Impact Logging (RIL) and generally follows good practice guidelines. Extensive management is allowed in short-term forest concessions (up to five years validity and not exceeding 5,000 ha), on most of the community forests and the so-called “timber harvesting licenses.” In these cases, timber can be harvested without prior timber inventories and planning and demarcation of roads and skid trails; this means that no RIL is implemented. Conventional logging is also allowed on specific felling blocks of larger concessions. In particular, it is allowed on specific felling blocks of medium-term (5 to 10 years and up to 50.000 ha) and long-term concessions (up to 20 years and 150.000 ha); reasons of area productivity and/or other natural difficulties may be invoked for this purpose. Forest companies implementing intensive forest management have complained about a policy of tolerance with communal forests which can result in overexploitation (Personal communication, May 9, 2017).

³500 tree species identified and 100-150 species usually found per hectare. The CELOS Management System uses three lists of species for consideration in ongoing and future harvest operations. The largest list, which also includes 43 potential commercial species, comprises 94 species (Jonkers et al. 2011). Regardless, the number of regularly marketable timber species is frequently estimated to be around 30. The demand varies significantly among species.

⁴In the order of 8,8m³ to 10,7m³ /ha under controlled logging, well below the legal limit of 25m³/ha in rotations of 25 years).

There is little information on illegal logging in Suriname, although this is currently being improved. The last research published on the subject dates back to 2006-2007 (ESS Environment 2006, Playfair 2007) and estimates that unreported forest exploitation could account for 20 percent of the documented volumes. Although a significant amount, this volume is well below what was reported at that time for several other tropical timber producer countries in South America and the world (World Bank, 2006). To improve the access to information and enable field actions to improve the situation, Suriname has established a now semi-operational Near Real Time Monitoring System (NRTM), which provides alerts on unplanned activities in the forest based on Sentinel 2 satellite images. A feedback mechanism related to unplanned logging will also be integrated into a Sustainable Forestry Information System for Suriname (SFISS), expected to improve the detection of illegal logging activities.

External factors have significant impacts on forestry in Suriname, as well as in the way forests are protected and managed. For example, due to insufficient land use planning and weak monitoring and enforcement of mining regulations, mining activities may take place inside of forestry concessions. Actors in the forestry sector may argue that investing in Sustainable Forest Management is not worth the effort, since their planning could be destroyed by mining activities at any time. In addition, when mining concessions are located on forests with commercial timber, the wood resources are not adequately used. Other types of unresolved land-use planning and the lack of general and specific environmental legislation also impact the forestry sector (NIMOS, SBB and UNIQUE 2017).

While the forestry sector does not contribute to direct deforestation, poor logging practices and overexploitation may result in forest degradation. The resulting levels of degradation relate to eligible activities under the scope of REDD+, including the reduction of emissions from forest degradation, conservation of forest carbon stocks, and sustainable forest management. Based on research by Griscom- using RIL (taking into account the reduction of impact related to Carbon) can reduce emissions with 30-50%.

In this regard, the most relevant underlying factors behind forest degradation due to forestry are:

- Fast growing increment of timber production in Suriname in the last years;
- Increasing global demand for tropical timber;
- Use of excavators that cause unnecessary damage in the skidding process;
- Need to improve law enforcement;
- Need to improve regulatory status of operational guidelines and procedures; and
- Limited resources in the responsible organisations.

The National Forest Policy of 2005 expresses that the lack of sufficient capacity in both the private and the public sector is one of the most pressing problems that need to be resolved. Capacity building requirements are observed not only for the wood production sector, including the community forests and for the management of protected areas. To some extent this assessment is valid today. The REDD+ strategy includes specific measures for addressing these aspects.

⁵Let wel dat illegaal hout over het algemeen op enig punt binnen de commerciële keten, “gelegaliseerd” wordt.

Mining

Besides being blessed with large forests, Suriname is also rich in minerals. The mining sector traditionally has been a leading contributor to Suriname's economy. The extraction and processing of bauxite, oil, and gold deposits have historically accounted for around 30 percent of GDP and as much as 90 percent of exports; in 2014, they represented 76 percent of total exports (WB, 2017). This is expected to continue in the coming years, with the Government having expanded its involvement in large-scale mining. (WB, 2017). The share of this sector in the GDP in 2008-2015 dropped by almost 50% from 28.5 percent in 2008 to around 15 percent in 2015. The complete cessation of all activities of the bauxite industry in November 2015 and the decreasing production of the other subsectors contributed to the significant declining share in the GDP and the negative growth rate in 2015 and 2016 (OP, 2017).

The mining sector is the driver of 73% of total deforestation in the 2000-2015 period, and 95.5% of it is caused by gold mining. A research study from 2015 (Rahm et al 2015) states that gold mining induced deforestation in Suriname has doubled between 2008-2014 as compared to the 2001- 2008 period.

Gold

Suriname has large gold deposits that have been confirmed by studies conducted in the past by mining multinationals. Gold mining is mainly concentrated on areas of Eastern Suriname known as the Greenstone Belt, which is rich in minerals and where most of the deforestation occurs, concentrated around the Brokopondo Lake.

The large, medium and small-scale activities in the gold sector have different characteristics. Most of the artisanal small-scale gold mining is unplanned, and the total area deforested by small-scale gold mining activities is significantly bigger than the impact caused by large-scale gold mining. The large-scale gold sector develops the economically extractable large gold ore deposits with foreign capital, in the course of which the government participates as a shareholder. The negotiations of the contracts with foreign companies thus has a key effect on the government and foreign exchange income of the country.

The country's largest gold mine is Rosebel, which is operated by Canadian based mining company, IAMGOLD. The open pit mine is located in Brokopondo district in the northeast of the country, part of the Greenstone Belt. To date, the mine has produced just over 3 million ounces of gold in the first 11 years of production. The Government of Suriname has a 5 percent free equity participation in the venture (WB, 2017).

The second major gold project in Suriname is the Merian Gold project, which is owned and operated by Surgold, a limited liability company in turn owned by American based mining company, Newmont. The deposit is in the east of the country. The project started in 2004, and construction began in 2014; production was slated to begin in late 2016. Newmont expects annual gold production to be between 400,000 to 500,000 ounces. The government exercised an option to participate in a fully-funded 25 percent equity ownership stake through the state oil company Staatsolie (WB, 2017).

Large-scale gold mining has relevant impacts in both deforestation and environmental degradation. The operations are frequently regulated in a specific agreement between companies and government authorities. Insufficient monitoring of operations and compliance with relevant regulations is nonetheless frequent (NIMOS, SBB and UNIQUE 2017).

The medium and small-scale gold sector, in which both Surinamese and numerous foreign miners participate, exploit the gold ore deposits with local capital. The business entry costs are relatively low, increasingly attracting people to the interior of the country to try their luck. The demand for gold is stable, but the prices fluctuate and thus the revenues for the government. Wages in the medium and small-scale mining sector are comparatively high and as a result there is a stable supply of labour.

Artisanal and Small-Scale Mining (ASGM) became an attractive activity for Maroons in East Suriname in the 1990s. However, today both Brazilian garimpeiros and Maroons prevail in the workforce of this sector. ASGM in Suriname has low levels of investment and mechanization, but nevertheless may utilize excavators and heavy machinery; with minimal investments in exploration and planning. ASGM also takes place today on legal mining concessions but frequently under irregular circumstances, in informal arrangements with concessionaires; few concession holders comply with the legal reporting and permission and legal requirements (NIMOS, SBB and UNIQUE 2017). ASGM is extensive in Suriname, particularly in the interior of the country: it is responsible for 60 per cent of all Surinamese gold production and a major source of employment.

ASGM is associated with extensive environmental degradation, including deforestation, severe erosion, river siltation and mercury pollution. Most often no efficient vegetation removal is carried out, large trees are slashed and the rest is burned. Due to the fact that many operations lack a mining permit, small miners tend to work far from access roads and selling the wood becomes impossible or unprofitable.

Overall, several underlying factors interact to influence the development characteristics of mining in Suriname and its impacts on the forest resource (NIMOS, SBB and UNIQUE 2017, GOS 2013), most of them related to gold mining. In summary, they are:

- Economic factors, particularly international gold prices; their importance is increased by the economic crisis and currency devaluation in Suriname;
- Low taxes on gold, stimulating migration from neighboring countries;
- Demographic factors, immigration, particularly Brazilians, very active in small-scale gold mining;
- Limited livelihood alternatives for forest dependent communities, combined with the low opportunity costs of abandoning alternatives such as farming for small gold miners;
- Infrastructure development, increasing accessibility of the interior;
- Increased accessibility to specialized mining methods and equipment; and
- Policy and institutional factors, such as: weak monitoring and enforcement of existing regulations; lack of mandatory legislation on the evaluation and management of environmental and social impacts; lack of transparency in policies regarding ASGM, such as no public availability of information on concession titles and difficulties for obtaining information.

Bauxite

Bauxite has historically played a central role in Suriname's mining sector. The major bauxite mine has been producing since 1916. More recently, bauxite was refined and transformed into alumina. This major operation facility closed in 2015, representing a significant economic blow to the country in terms of jobs and revenues.

Many of the country's large bauxite deposits had—by 2012—been mined out; the government is currently evaluating opportunities for relaunching and expanding bauxite production. Reviving the bauxite sector (e.g. the possibility of exploiting the Bakhuis area), will require significant investments in infrastructure to reach new and remote deposits, while there are also significant social and environmental liabilities and risks that must be addressed. Assuming state management of the sector in the absence of an international investor is seen as risky, given the required investment and current pricing on international markets (IGF 2017).

Other factors

Agriculture

Since its establishment in 1667 as a Dutch colony, Suriname plantations were set for the exploitation and production of sugar and coffee. The history of Suriname's economy is therefore linked to the establishment of several hundreds of plantations established along the rivers of the coastal area. Although plantations as the basis of the Surinamese economy had already declined in the 19th century, it continued to be relevant until the first half of the 20th century (Berrenstein, 2016).

The contribution of the agriculture sector to the national economy was 17% of the GDP in 1987. In the past decade it has represented between 10 and 13%. It is also a relevant source of employment, with 17% of the labor force in the country employed in the agricultural sector (NIMOS, SBB and UNIQUE 2017). The main export products are rice, fish, shrimp, bananas and other fruits and vegetables. Combined they represent an export value of approximately 100 million US dollars per year. The first three are also considered the sectors with more comparative advantage for the future (World Bank 2017).

There are approximately 60.000 hectares dedicated to agricultural production, the majority of which are for rice in the Nickerie District, North-West of the country. This 60.000 hectares represent less than 5% of what is theoretically suitable for agriculture (around 1.500.000 hectares), most of which is located in the coastal plains. More than 60% of the current area under production consist of family holdings and the majority of holdings (90%) are smaller than 5 hectares (World Bank 2017).

In the past decades there have been different approaches to explore the establishment of large areas for the production of palm oil (90.000 hectares) and sugar cane (12.000 hectares) by foreign and national investors (Latawiec et al 2014). However, these incipient developments are not yet materialized, and agriculture remains, for the time being, responsible for barely 3% of the deforestation registered in the past 15 years, representing approximately 2.300 hectares (NIMOS, SBB and UNIQUE 2017).

Studies have shown that Suriname can increase the production of rice without expanding rice area (Latawiec et al 2014) and that the areas under cattle ranching have been decreasing. Researchers have concluded that livestock is not expected to become a major driver of deforestation in the current situation, particularly if no additional incentives are introduced in the sector, such as through legal reforms (NIMOS, SBB and UNIQUE 2017).

In the conversion of forest land to agriculture, subsistence farmers, small-scale farmers, medium commercial farmers and medium and large-scale investors intervene. There are two groups of proximate drivers: permanent crop cultivation causing deforestation, and shifting cultivation causing forest degradation. Permanent crop cultivation is the most common agricultural production method in the coastal plain of Suriname, whereas shifting cultivation is the most common one in the interior of Suriname, mainly aimed at subsistence or local consumption purposes.

Agriculture, excluding shifting cultivation, contributed to 3% of deforestation occurred in the 2000-2015 period, with 2,344 ha. This deforestation trend has increased in the last years, from 97 ha/year in 2000-2009 to 245 ha/year in 2009-2015. The OP aims to ensure the availability of production areas and the associated infrastructure like roads and structural works for both population and large-scale agriculture.

Regarding shifting cultivation, the UN-REDD Programme (2015) refers to long-fallow shifting cultivation as a forest degradation driver, and short-fallow shifting cultivation as a deforestation driver. As the development and presence of secondary forest regrowth is regularly observed during the fallow periods of shifting cultivation in Suriname (fallow length and site conditions generally allow it), shifting cultivation is herein categorized as a driver of forest degradation. In this case the forest landscape shows an interaction between land and vegetation clearing for cropping purposes and secondary forest regrowth in the fallow periods. Nevertheless substantial differences in fallow length exist in different areas, and fallow periods as short as three years are recorded for shifting cultivators of root crops and pineapple in Brokopondo and Cottica area and in Para, contrasting with fallow lengths of 5 to 15 years in other areas (NIMOS, SBB and UNIQUE 2017).

The shifting cultivation landscape increased in 16,651 ha between 2000 and 2015. However, the expansion trend was reduced in the 2009-2015 period, when a total of 2,214 ha were converted (369 ha/year); conversion of forest to shifting cultivation land had taken place on 14,436 ha (1,604 ha/year) between 2000 and 2009.

There are several underlying factors contributing to agriculture as a proximate driver. They include:

- Economic factors, such as an increased global demand for agro commodities;
- Government support of fruit and vegetables production by supplying inputs to small and medium-scale farmers;
- Limited capacity to stimulate and implement sustainable agricultural practices;
- Weak monitoring and enforcement of agrochemical use;
- Limited livelihood options for forest-dependent communities; and
- Insufficient spatial planning.

Infrastructure

Infrastructure, mainly road construction, is the second largest driver of deforestation, responsible for 16% of total deforestation, 13,329 ha in the 2000-2015 period. Infrastructure development has a relatively minor direct impact on deforestation, but provides accessibility and is linked in this indirect way to other deforestation and forest degradation drivers with a cascading effect. For example, deforestation, particularly led by ASGM activities, takes place mostly in the proximity of existing road networks.

Although efforts in studying the drivers of deforestation in Suriname were led to understand the cascading effects of infrastructure and urban development, defining clear and quantified effects across sectors is challenging, as the same study recognizes that the spatial analysis cannot explain “the exact relationship between infrastructure and mining in terms of which activity precedes the other.” (NIMOS, SBB and UNIQUE 2017).

Urban development

Housing construction in Suriname was the cause of 4% of deforestation in 2000-2015, or 3,451 ha. The trend increased from 114 ha/year in the 2000-2009 period to 404 ha/year for 2009-2015. While the moderate population growth rate of Suriname (around 1% annually) contributes to a reduced impact of this driver, conversion of land from coastal vegetation areas and forests to urban use is expected to continue in the process of fulfilling housing demands (GOS 2013). Underlying drivers include Suriname housing shortage as well as the Government support of housing projects.

2. POLICY AND LEGAL FRAMEWORK

Legal framework and policies for environmental and forest management

As a party to the United Nations Framework Convention on climate Change (UNFCCC) and a signatory to the Paris Agreement, Suriname is ready to work towards the protection of its forests to contribute to global mitigation efforts, as well as to continue promoting and introducing the use of renewable energy, specifically in remote areas, provided that adequate financing is made available to support these transitions. (GOS, 2015) Suriname has highlighted its commitment with the global efforts in its Intended Nationally Determined Contribution (INDC) presented in September 2015 and emphasized this approach in its National Development Plan 2017-2021.

Suriname is not only engaged in the fight against climate change, but is also a party to other relevant international agreements, including: the United Nations Convention on Biological Diversity (CBD); the International Tropical Timber Agreement 2006 (ITTA); and diverse human rights conventions. The national legal framework states the basis for respecting the international compromises adopted by the country, as national regulations incompatible with the provisions of the ratified international agreements should not apply, in accordance with the National Constitution (National Constitution, Article 106).⁶

National policies and legislation

The protection of forests in Suriname is foreseen in the National Constitution, which highlights the relevance of natural resources for the country and their use *“to promote economic, social and cultural development.”* (Article 41)

The framework relevant to REDD+ implementation in Suriname is also integrated by diverse laws and policies that relate to the protection of the environment, natural resources, forest management and land-use planning. In recent years, the country is engaged in updating its legal framework to better integrate the three pillars of sustainable development. Such initiatives are led by the National Institute for Environment and Development in Suriname (NIMOS), which was established in 1998 with a mission to enhance the national legal and institutional framework for environmental protection and sustainable development.

In 2000, a process to develop an environmental protection act was set in motion. In the meantime, NIMOS has released Environmental Assessment Guidelines that apply on a voluntary basis and provide minimal requirements to assess environmental and social impacts of diverse types of activities. The continued efforts towards the adoption of an environmental act can have a pivotal role in the implementation of this strategy. The following sections highlight the main features of policies and laws regulating relevant aspects concerning REDD+ implementation.

National Development Plan 2017-2021

A key strategic instrument guiding the development planning in the country is the National Development Plan (OP), which has a constitutional base, and sets out the State's social economic development for a period of 5 years (2017-2021). It aims at both strengthening the development capacity of the country, and achieving sustainable development by combining economic, social development and the responsible use of the environment, while allowing future development opportunities.

⁶However, it is often required that the international agreements need the adoption of national legislation to be implemented.

The four pillars that compose the Development Plan 2017-2021 are: the strengthening of developmental capacity; economic growth and diversification; social progress; and the use and protection of the environment. Climate change and the use of the forests' economic value are considered within the last pillar on environmental protection.

On climate change, the OP indicates that the country will work on attracting further investments to commit to further reducing greenhouse gases emissions, using energy and other resources more efficiently, and minimizing the loss of biodiversity and damage to ecosystems.

Forestry laws and policies

There are a number of relevant policies that set the goals for the protection and exploitation of forests in the country.

The National Forest Policy (NFP) adopted in 2005 is one of the key policies guiding the functioning of forestry in Suriname. The NFP sets key objectives and principles for the forest sector and was built through a participatory process. The main forest policy objective is "enhancing the contribution of the forests to the national economy and the welfare of the current and future generations, taking into account the preservation of the biodiversity" (GOS, 2006).

To overcome institutional weaknesses and to generally support Sustainable Forest Management within the country, there is also a draft law from 2005 meant to install a Forest and Nature Authority (BOSNAS). Within this process the SBB will be merged with the National Forest Service (LBB) and the Nature Management Division (NB) of the Ministry of RGB. Preparatory work was done in 2003-2005, but the law was not yet adopted. The Minister of RGB has now committed to start up the process again. The aim is to create a strong, contemporary and holistic authority, responsible for the management of the Nature and Forest areas in the country. The National Forest Monitoring System will be institutionalized as an integrated component of the authority. BOSNAS can also be instrumental in ensuring successful and cost-effective implementation of the REDD+ Strategy.

The Interim Strategic Action Plan for the Forest Sector in Suriname 2009-2013 (GOS 2008) is based on the NFP and prioritizes four of the seven NFP's strategic goals. The prioritized goals are considered as "the true strategic goals" and are oriented towards economic objectives. They relate to: increasing the contribution of commercial forestry and the forest industry to the national economy by increasing sustainable timber production, industrial added value and exports; increasing the contribution of multiple-use community forestry to the national economy by increasing the production of timber and NTFP from communal forests; increasing the contribution of NTFP to the national economy; increasing the physical and financial contribution of ecological functions to the national economy by realizing their monetary value; and preserving biodiversity and essential environmental functions by the expansion and sustainable management of the protected areas network. These national policies clearly reflect the call for shifting the profile of forestry as a source of additional income for the country.

Although forest policy provides strategic guidance, its reflection on laws and regulations governing the forest sector is limited, as the NFP highlights. There is therefore a need to bring national laws closer to the policy objectives set at the national level. A good example of this is the Code of Practice for Forest Operations (CoP), which was developed in 2011 to describe the best practices for sustainable forest management. Although some elements of the CoP have been already considered within concession requirements, the need for a previous phase of field validation and its lack of legal formal adoption means that its provisions do not have a mandatory status. In turn, this hinders the ability of relevant authorities to implement an effective control of operations.

The main law governing forestry is the Forest Management Act (1992). The norm addresses forest management, forest exploitation and the primary wood processing sector. It sets the provisions for the national authority to grant permits and concessions for forest product harvesting (including timber), with a productive focus. It defines the types of licenses for harvesting timber and other forest products through different categories of concessions and the use of community forests.

The Forest Management Act (1992) is a useful forest management instrument, stating objectives, responsibilities and administrative procedures. However, ensuring that the forest resource is used in accordance with those objectives and responsibilities requires further and more detailed and updated regulation, as well as adequate supervision and enforcement. For example, the norm provides the basis for using sustainably NTFP, but further regulation is needed for its operationalization. In addition, more development of, inter alia, stakeholder engagement, legal tools for conservation of forests in private lands or mangroves seems to be necessary.

Nature Conservation and Protection laws and policies

The protection of biodiversity and nature is key for the sustainable development of Suriname, due to the extended and rich forests that cover its territory. The country has developed a National Biodiversity Strategy 2006-2020 (NBS), which establishes a national vision, goals and strategic directions to conserve and sustainably use the nation's rich biodiversity. The NBS highlights the country's commitment to protect and enhance "the diversity of the country's cultural and natural heritage". A National Biodiversity Action Plan (NBAP) 2012-2016 was adopted and foresees more specific objectives for the conservation and sustainable use of biodiversity in the country⁷.

Concerning laws, nature conservation in Suriname has greatly relied on the Nature Conservation Act (1954) and the Game Act (1954), both from colonial times. The legal framework sets protected areas of diverse categories, which were the basis for the protection of nature. The existing categories are: i) Nature Reserves, in which specific species or ecosystems are protected and human activities are limitedly allowed in accordance with the Nature Conservation Act; ii) Multiple Use Management Areas (MUMAs), a category covering almost the entire coastal area of the country, where economic activities are allowed provided that specific protection goals are not threatened (cfr. L-Decree); iii) Nature parks, in which activities with minimal impacts, such as recreational, are allowed; and iv) Specially Protected Forests, which have a particular value due to, inter alia, forests location, flora or fauna with specific aesthetic, educational, cultural, scientific or recreational value, as provided in the Forest Management Act. Another possible category of forest protection could be applied to forests that have a relevant stabilizing influence on the natural environment, considering soil and hydrological features, as provided in the Forest Management Act. Although it has not yet been used, this category could be relevant for the protection of mangroves and forests located on mountain slopes.

As a result, over 2 million hectares of forests and forests ecosystems are comprised in 16 protected areas in Suriname: 11 Nature Reserves, 4 Multiple Use Management Areas (MUMAs) and 1 Nature Park. Remarkably, the categories of protected areas in the national legal framework do not conform to internationally applied categories, which may hinder planning and management consistency (Conservation International, 2016). Current efforts in updating and adjusting these laws is intended to enhance transparency in the procedures, provide criteria for the establishment of protected areas, ensure stakeholder participation and set legal instruments that ensure compliance with area protection.

⁷Some of the specific actions in the NBAP relevant to REDD+ include: amending norms and policies to protect biodiversity inside and outside protected areas; set an adequate and effective system of protected areas; the rational allocation of land uses, considering biodiversity protection; responsible mining; sustainable forestry and forest restoration; responsible tourism; responsible agriculture; regulated access to genetic resources in indigenous peoples and tribal communities with fair and equitable benefit sharing; local cooperation and involvement of communities in biodiversity protection.

The Government Policy Statement 2015-2020 states the aim to update the nature protection legal framework. In practice, this means incorporating internationally accepted principles, such as innovative approaches to cooperation and co-management of protected areas, and inclusion of rights-based approaches to recognize in the legal framework the involvement of indigenous and tribal peoples in the protection of nature. This also means making progress in requiring environmental impact assessment to activities with potential effects on protected areas, as well as undertaking impact assessments before protected areas are established.

Mining laws and policies

Mining is one of the most relevant economic activities in the country. The activity is mainly regulated under the Mining Decree (MD) from 1986. The law governs the exploration and exploitation of mineral resources in the country. It provides for granting of different categories of mining rights and other licenses for the different groups of minerals, as well as for inspection and monitoring. The regulation of operations of large-, medium- and small-scale mining are nonetheless subject to diverse provisions and regulations. For example, often the mining rights of companies undertaking major operations are generally addressed in specific agreements between the government and the company. The agreements tend to set the specific considerations for exploitation and social and environmental considerations.

The mining law contains limited provisions on the consideration of the social and environmental impacts of mining activities. The MD generally recognizes the need to consider the environmental impacts of mining activities, as they must consider 'valid norms in the field of safety and health of personnel in particular, and the community in general as well as regulations for the protection of ecological systems.' (MD, Art. 8.1). Moreover, upon termination of a mining right, "the right holder shall, to the approval of the Minister, execute all necessary measures in the interest of public safety [...] and protection of the environment" (MD, Art. 16.1) However, the assessment of the impacts of mining activities on the environment, society and particularly on forest protection greatly relies on NIMOS' ESIA voluntary guidelines. The guidelines have been integrated in administrative procedures for large-scale mining permits. The voluntary guidelines could be truly enforceable if transformed into national legislation, a process that the national authority is undertaking. However, currently their voluntary nature allow for dependence on the discretionary powers of authorities and challenges to their enforcement.

The mining laws and policies denote the need for further reconciliation of key economic sectors with forest or other land use legislation to facilitate the protection of forests and more generally the implementation of REDD+. The interactions between the mining sector and REDD+ implementation is addressed in this strategy with a view to minimize further deforestation, forest degradation, and pollution by mining activities.

Recognizing existing challenges on this regard, the Surinamese government is already undertaking diverse initiatives at the policy level. "The government is in favour of a regulated and responsible expansion of the mining industry, including an improved regulation of the informal gold-mining activities. The mining policy is aimed at the preparation and adoption of legislation for the minerals institute and the mining act. The preparations of the minerals institute will be developed during this planning period. The goal is to merge the Geological Mining Department (GMD), the Bauxite Institute Suriname (BIS) and the Suriname Gold Sector Regulation Commission (OGS – Dutch abbreviation)." (OP, pg 80)

Moreover, efforts to enhance transparency in the mining sector are already underway. "A successful extensive inventory has already been made of minerals and geological maps of the south border of Suriname, in cooperation with the government of Brazil and Austria. Further work is going to be undertaken to increase the transparency and reporting of the income and expenses in the mining sector." (OP 81)

In this context, Suriname became a member of the Extractive Industries Transparency Initiative (EITI) on 24 May 2017 and relevant efforts to formalize the small-scale gold mining sector are intended to be undertaken. The Government is in favour of a regulated and responsible expansion of the mining industry including an improved regulation of the informal gold mining activities. This is also to guarantee the revenues for the State in the form of royalties and taxes. Efforts to eliminate the use of mercury to the benefit of the environment and the health of the citizens is also an objective for the 2017-2021 planning period. On 2 August 2018, the Government of Suriname deposited its instrument of accession, thereby becoming the 95th Party to the Minamata Convention. The aluminium industry is expected to be promoted, particularly the exploitation of the bauxite deposits in West Suriname.

Land-use Planning laws and policies

Land use and land use planning are of critical importance to ensure a balanced approach towards the implementation of REDD+, while supporting the wellbeing of society at the local and national levels. The current legislation on planning is scattered across various norms and regulations and administered by different ministries and government agencies.

There is no land use/spatial planning act, which results in unregulated parceling in non-urban areas; unauthorized changes in land use and substandard land development schemes with poor layout design; and inadequate physical and social infrastructure (WWF Guianas, 2016).

Efforts to further streamline and coordinate the action of public planning functions are at the center of governmental actions, which will certainly contribute to facilitate the implementation of REDD+. Moreover, such planning exercises need to be increasingly visualized through public participation. Public participation in the land use planning process is key to community ownership and compliance with land use plans. However, the current legal framework provides for a minimum standard, consisting of a more consultative and top-down approach.

Challenges in the past for land-use planning included: the issuance of overlapping mining and forestry concessions and community forests, double issuance of domain land, lack of structure and zoning plans in urban areas, and land degradation in protected areas (WWF, 2016).

Institutional framework for environmental protection and forest management

The two most relevant institutions playing a role in the management of environmental protection across sectors in the country are the National Council for the Environment (NMR)⁸ and NIMOS. NIMOS provides support to the NMR in creating a national legal framework for environmental management and in implementing it. NIMOS has also a relevant role in addressing environmental complaints and monitoring compliance with environmental regulations in collaboration with other ministries and agencies.

In addition, in 2015, an Environmental Coordination Functional Unit was created in the Cabinet of the President to formulate and coordinate the adoption of environmental policy and legislation, serving as an environmental focal point for international conventions and agreements.

Regardless, the responsibilities relevant to environmental protection and forest management are under the responsibility of diverse institutions and ministries,⁹ as exemplified in the table below.

Ministry of Spatial Planning, Land and Forest Management	<p>Is responsible for the issuance of Domain Land, physical planning, nature conservation and forest management.</p> <p>Under this ministry:</p> <ul style="list-style-type: none"> • The Foundation for Forest Management and Production Control (SBB) was established as a vehicle towards a Forest and Nature Authority and is responsible for the enforcement of the Forest Management Act (1992) and, consequently, for the management of production forests; • The Suriname Forest Service (LBB) is responsible for the enforcement of the Nature Conservation Act from 1954 and the Game Act from 1956; • The Nature Conservation Division (NB) is responsible for the daily management of the nature reserves and other protected areas; • The Jan Starke Training and Recreation Centre (JSOOC) is responsible for the promotion of nature conservation and environmental protection, and for sustainable use and conservation of forests.
Ministry of Natural Resources	<p>Responsibilities for the protection of water resources, policy, drinking water supply, energy resources, and mineral resources.</p> <p>Under this ministry:</p> <ul style="list-style-type: none"> • The Geological Mining Division (Geologische Mijnbouwkundige Dienst) is responsible for monitoring of mining licenses.
Ministry of Agriculture, Animal Husbandry and Fisheries (LVV)	<p>Has responsibilities for policy elaboration and implementation on agriculture, livestock and fisheries, research in these sectors, and management of fisheries, among others.</p>

Table 1. Some of Suriname's Institutions and Ministries responsible for environmental protection.

Source: Own Elaboration

⁸Established in 1997 as an advisory body to the government, the Council is not currently operative and will cease to exist. Information provided by (Cabinet of the President, Environmental Coordination Unit) with M. Gomperts and I. Patterzon

⁹S.B. 1991 no. 58, last amended by S.B. 2017 no. 11

Land Tenure¹⁰

The national legal framework on land tenure states that 'All land to which the right of ownership cannot be proven by other parties, is property of the State'. (L-Decrees of 1982, (Art. 1, section 1)). This is one of the main reasons why regardless of whether they are traditionally occupied or subject to other uses, 97% of forested lands in the country are state-owned.

Most forests in Suriname are in the interior, in the Southern part of the country, where indigenous and tribal peoples live. These communities depend on forests for many reasons, including for productive activities, such as subsistence agriculture, hunting, fishing, timber harvest and small-scale gold mining. Suriname is one of the countries in the world where there are still indigenous and other tribal people that live a traditional way of life in these forests. Until some decades ago the coastal area and the interior of Suriname developed virtually independent from one another. This situation changed in the 1960's when access to the interior increased for economic development purposes such as the construction of the hydropower dam. This resulted in a growing number of land related conflicts between the indigenous and tribal peoples and the Surinamese Government and individuals.

The result of this situation is that the issuance and management of land in Suriname are governed by two systems; the traditional customary system and the national legal system in force. For decades one did not interfere with the other, but more recently development activities in the areas where these communities live has posed increasing challenges for their traditional system.

Indigenous and tribal peoples claim exclusive and inalienable rights to the village grounds and their surrounding forests lands (The Amazon Conservation Team Suriname, 2010; Binmore, 2011). In spite of this, they have not obtained personal or real titles to the lands that they inhabit and use. Legal provisions recognizing and protecting these rights are notably absent. (IDB 2006, p 13.) Hence, they do not have any formal rights to these lands and related resources, thus being all state property. In addition, the lack of secure tenure lands seems to be a relevant hindrance to forest protection. First, ITPs cannot exert rights to evict from their land third parties carrying other activities incompatible with forest protection nor claim against the granting of permits by governmental institutions to carry out such activities. Moreover, ITPs also resist the establishment of protected areas, fearing that this may imply recognizing the State's ownership and titling of their lands. (Report VIDS, 2009, p. 14).

In spite of lacking formal title to lands, there are regulations in the legal framework that implicitly recognize some kind of obligation to respect the customary rights of ITPs (The Amazon Conservation Team Suriname, 2010). There are peace treaties between the tribal groups and the Government from the 18th century which declare the tribal land to be sovereign under the leadership of the chief. However, the treaties were not included in the legal framework of the Republic Suriname with its independence in 1975. In addition, relevant instruments implicitly acknowledging these rights are: the L-Decree, which leaves room for respecting the tribal lands provided that it is not contrary to the general interest of the State; the 1986 Mining decree; and the 1992 Forest Management Act.

¹⁰While a more detailed analysis of the land tenure situation of the country will be developed, some key aspects analyzed on land tenure are highlighted to provide key understandings for the development of this strategy.

The lack of a formal land tenure system for ITPs results in conflicts over land and resources. Such conflicts are of diverse nature and include (Ibid):

- Conflicts between ITPs and the government due to intrusion into ITP lands by government and private interests or the prohibition to ITPs to perform what they consider to be their traditional livelihood activities;
- Conflicts about land rights and tenure within and between Tribal and Indigenous groups;
- Conflicts between the members of different tribal groups on, e.g. the violation of land tenure boundaries, particularly between the Tribal peoples;
- Conflicts between the members of different segments of one tribal group;
- Conflicts between the leader(s) of a group and his/hers/their people, which may arise when group members feel that their customary leaders are working for themselves rather than for the group benefit. For example, this has been often the case with the so-called communal forest, which was introduced in the Forest Management Act 1992 (Wet Bosbeheer 1992), and the earlier version of community forests called HKVs introduced under the Wood Law (Houtwet 1947). The law prescribes that these community forests are allocated in name of the village kapitein, for the well-being of the entire village. Problems regularly arise when the captain 'leases' part of the HKV or comunal forest to larger-scale loggers or uses the community forests commercially in another way, without sharing information or gains with the villagers.

Various government administrations have placed the issue of recognition of land rights of the Indigenous and Tribal communities on their agenda. Many of them were reflected in different instruments, such as the Lelydorp Peace Accord providing arrangements for the recognition of Tribal and Indigenous land rights (art. 10), and the Buskondre Protocol, or Presidential Resolution No. PO 28/2000, which stated that: 'starting April 1, 2000, the Government of Suriname recognizes the collective rights of Indigenous and Tribal Peoples on the lands they respectively live on [...], and that those territories later [...] will be recorded on maps with coordinates and placed at the disposal of the respective traditional authorities' (Art. 1, cited in The Amazon Conservation Team Suriname, above).

Land tenure and REDD+ implementation

During the past decades, the international community has become increasingly aware of the history and the circumstances of indigenous peoples in the world.

Suriname participated in the Interamerican System of Human Rights and has accepted the jurisdiction of the Interamerican Court on Human Rights. Conflicts related to land tenure were the subject of three Court rulings presented by different indigenous and tribal peoples in Suriname, including the Moiwana, the Saramaka, the Kaliña and the Lokono peoples (Case of the Moiwana Community vs Suriname. Judgement of June 15, 2005; Case of the Saramaka people vs Suriname. Judgment of November 28, 2007; Case of Kalina and Lokono people vs Suriname. Judgment of November 25, 2015).

The ICHR rulings evidence that there are relevant aspects in the land tenure situation in the country that need to be addressed to provide further security and the respect of the human rights of ITPs. These issues are of utmost importance, considering the Cancun Safeguards adopted by the UNFCCC for the implementation of REDD+, which intend to ensure that REDD+ does not result in harm for society or the environment.

The Court rulings have, inter alia, ordered the state to demarcate and grant collective titles over ITPs lands; abstain from further acts (such as establishment of protected areas) until delimitation, demarcation, and titling has been completed, unless the State obtains the free, informed and prior consent of the peoples in question.

On the collective juridical capacity of the ITPs (e.g. the Saramaka people), the rulings highlighted the need for recognizing their juridical collective personality in accordance with their communal system, customary laws, and traditions.

Moreover, the Court rulings link the recognition of land ownership with the ownership of natural resources. Regardless of the state regulations that may not recognize the rights of communities to use the forests located in their lands, the rulings state that rights to be recognized should not limit to land ownership but extend to 'natural resources traditionally used and necessary for the very survival, development and continuation' of indigenous and tribal peoples' way of life, including resources found on and within their territories.

In the Lokono and Kaliña case, the Court provided guidance that is a useful reference for the implementation of REDD+. The Court provided that in the establishment of natural reserves and pursuing the State interest, the collective rights of indigenous and tribal peoples must be weighed. It considered that there must be compatibility between the safeguarding of protected areas and adequate use and enjoyment of traditional territories, as such protected areas encompass socio-cultural dimensions. Moreover, the ruling recognizes the need to compensate communities affected by the aforementioned activities. Finally, it stated the need that ITPs share the benefits from projects in their territory.

Implementation of REDD+ in the country must take due account of the implications of the land tenure situation in general. For example, in the context of REDD+ in Suriname, delimitation and registration of territories that may be impacted by REDD+ activities.

The current land tenure situation in the country needs to be addressed for REDD+ implementation. Without remedies to the lack of formal recognition of their title to the lands that they inhabit and without the proper implementation of an Environmental and Social Management Framework (ESMF), REDD+ can potentially increase risks to forest dwellers and indigenous peoples' livelihoods, due to the potential revenue flows from protecting forests to third actors¹¹. The government has undertaken various initiatives to define and recognize ITPs rights to the land, including the development of a roadmap to their determination and demarcation. As the Strategic Environmental and Social Assessment (SESA) developed for this strategy demonstrates, such process acquires a key role in the context of REDD+ implementation.

¹¹Griffiths, T Seeing 'REDD?' 'Avoided deforestation' and the Rights of Indigenous Peoples and Local Communities, (Forest People's Program, 2007); F. Seymour, Forests, Climate Change, And Human Rights: Managing Risks And Trade Offs, (CIFOR, Bogor; 2008)

3. RESULTS OF SCENARIO EXERCISE

Suriname is currently in the REDD+ readiness phase, in which the institutional frameworks are strengthened and the National REDD+ Strategy is developed. An important part of this phase, is the development of spatial explicit scenarios. A land use change model was developed to simulate the scenarios. The three scenarios that were identified are: 1) Historical trend (business as usual), 2) Projected Development and 3) Development with REDD+. These scenarios, which will be further described in the following paragraphs, were a tool for the preparation of Section 3.

The results of the spatial explicit scenarios are relevant for the development of the National REDD+ Strategy and for determining the Forest Reference Emissions Level/Forest Reference Level (FREL/FRL).

Within the framework of developing the land use change model, SBB organized a training on the DINAMICA-EGO software which is used to create and execute the model. Other relevant stakeholders were invited to strengthen national capacity and institutional cooperation. Suriname will therefore be able to perform the modeling of different scenarios, which can contribute to the National Development Plans and other national objectives.

Calibration and validation of a land use change model for Suriname using DINAMICA-EGO

The deforestation in Suriname was simulated using a spatially-explicit, stochastic ‘cellular automata’ model called DINAMICA-EGO (Soares-Filho et al., 2002). In the calibration phase, the process of land use change is simulated based on explicit relationships between pixels with observed transitions (deforestation) and information of a set of spatially-explicit factors that are supposed to explain these transitions over a historical period. The relationship between transition pixels and determinants (explicit factors) is measured by the calculation of “weights of evidence”, that is positive when the determinant encourages the land use change, and negative in the opposite case (Mas and Flamenco, 2011). DINAMICA-EGO also allows the calibration of the shapes and spatial distribution of areas with changes, and the analysis of the deforestation by regions, which become useful tools in the process of future simulation. In the validation phase, a land use map is simulated using the information of the calibration phase, and compared against the actual map, for the same year (2015). This process allows to measure which is the percentage of correctly simulated pixels, in different scales, from pixels to landscapes.

Results from the calibration and validation phase

The calibration used the historic period 2009-2013 to build the weights of evidence and landscape parameters, and was validated against the observed land use map of 2015. The best result was found dividing the country in five different regions, according to historical patterns and socio-economic factors. The regions selected were: Greenstone belt, Forest belt, Rural area, Urban area and Interior (this region was not calibrated because no deforestation was found in the calibration phase). Different determinants were selected for every region (table 2). The shapes and distribution of the deforested areas were calibrated using the software Fragstats 4.2 (McGarigal et al. 2012).

Determinant	Greenstone belt	Forest belt	Rural area	Urban area	Interior
Distance to roads	X	X	X	X	
Distance to streams	X	X	X	X	
Distance to non-forest areas	X		X	X	
Distance to previous forest fires	X		X	X	
Distance to urban areas			X	X	
Distance to Bauxite-Laterite deposits	X				
Gold mining projects		X			
Geological units	X				
Elevation		X			
Slope		X			

Table 2. Determinants selected to explain the deforestation process by region in Suriname.

Source: Own Elaboration

The validation phase shows that according to the calibration parameters, the model can simulate correctly the exact location of 27% of all deforested pixels. That value reflects the difficulty to find accurate determinants, and the complex process of deforestation that is currently occurring in Suriname. We use the function in DINAMICA-EGO called Calc reciprocal similarity map to validate the simulation in broader scales, from 1x1 pixel window size (1 ha), until 41x41 pixels (1681 ha). This function compares the simulated and actual land use map in landscapes defined by squares centered on every simulated or observed deforestation pixel (calculate the similarity of actual against simulated map, and vice-versa, and the final value is the smallest). According to this analysis the model can simulate correctly more than 80% of deforestation in landscapes bigger than 16 sq.km. The configuration of the landscape is simulated correctly, according to the forms of the simulated areas of changes and the distribution. Besides, the change matrix in DINAMICA-EGO ensures that the amount of deforestation is correct (Figure 5).

In figure 5, Red colour shows the areas where deforestation was simulated correctly, blue represent areas where deforestation was simulated but not observed, and oranges represent areas where the model simulates remnant forest but was incorrect. The three scales in the map show the spatial validation from different perspectives, i.e. local or small projects (left bottom corner), deforestation front (right bottom corner) and country level (center up).

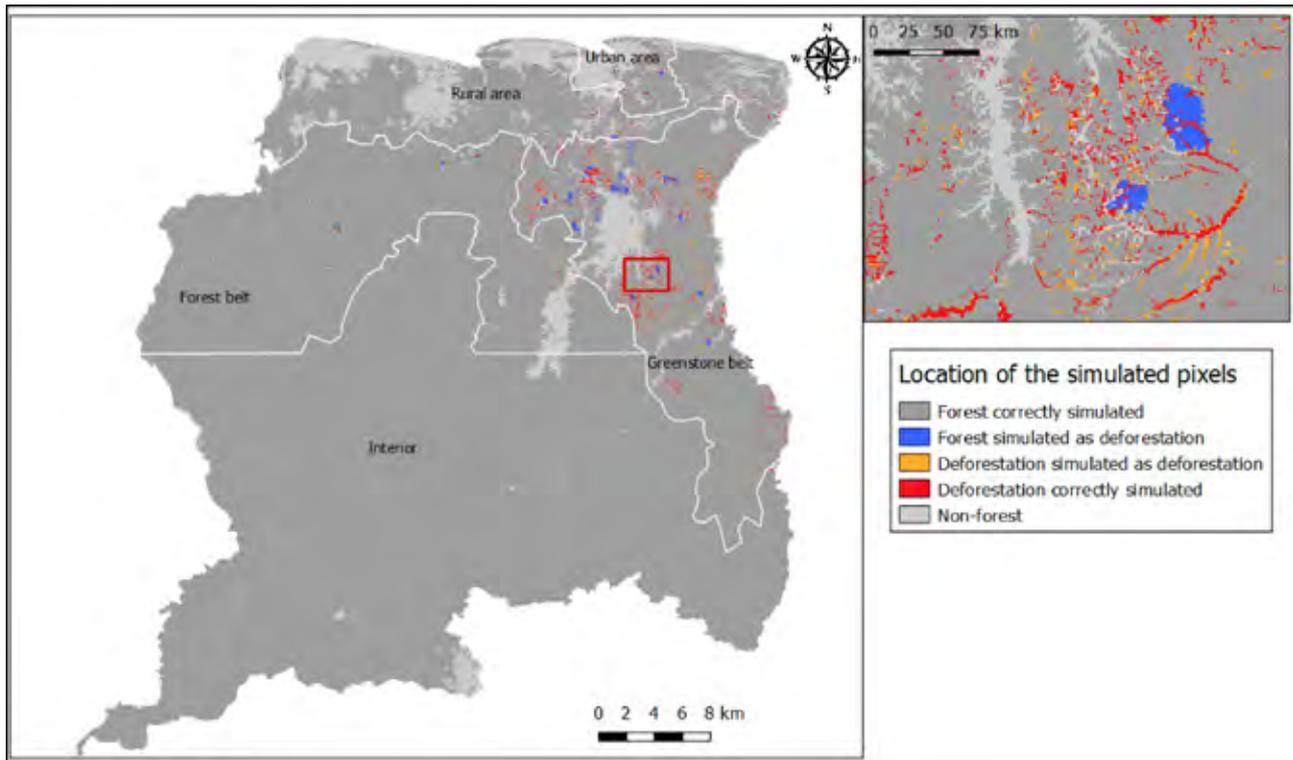


Figure 5. Spatial validation of the deforestation simulation model.

Source: *Own elaboration*

Results from scenarios modeling phase

After presenting the results of the calibration and validation phase of the land use change model to the relevant stakeholders, the next step was to discuss about different scenarios that should be simulated. The scenarios that were identified are:

- Historical trend (business as usual (BAU)) scenario: the assumption in the BAU scenario is that there will be no major differences in economic, technological and political development. The deforestation rate will remain stable and there will be no REDD+ implementation;
- Projected development scenario: the assumption here is that the development projects which are included in the Development Plan 2017-2021 will be carried out, except the projects with reforestation activities;
- Development with REDD+ scenario: the assumption in this scenario is that the development projects which are included in the Development Plan 2017-2021 will be carried out, but considering the implementation of REDD+ and the National Strategy.

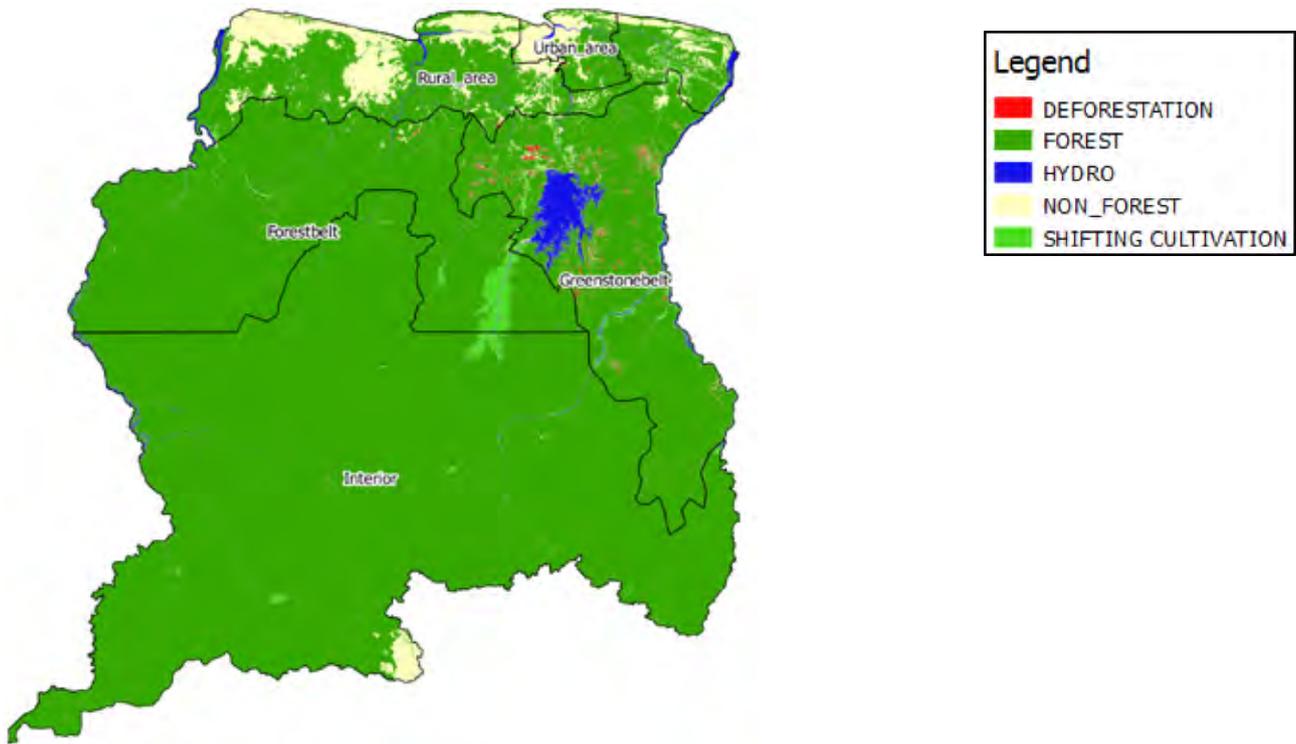
Category	Sub-category	Assumptions	
		Projected development scenario	Development with REDD+ scenario
Mining	Gold mining	All the gold mining concessions in Suriname are used.	Only the gold mining concessions within the Greenstone belt are used
		The large and small-scale gold mining concessions are expanded.	The large-scale gold mining concessions are expanded, but the small-scale gold mining concessions will not expand.
		Give same weight of evidence of the exploitation concessions to the exploration concessions after 5 years.	Idem
	Oil exploration	The oil exploration will shift between the Gangaram Panday weg and Weg naar Zee, leading to new infrastructure in this area.	Idem
	Bauxite mining	The Bakhuis project will be executed, but without the construction of the Kabalebo hydro power dam.	Idem
		Only the bauxite-laterite areas within the borders of the Bakhuis project will be deforested.	Idem
		Nassau mining concession with the Grankriki hydro power dam will be executed.	Nassau mining concession without the Grankriki hydropower dam will be executed.
Agriculture	Oilpalm	All the planned oilpalm projects will be executed.	Consider only the China Zhong Heng Tai (CZHT) oilpalm project.
Mangrove		Deforestation may occur in the mangrove forest.	There will be no deforestation in the mangrove forest.
Infrastructure		Tapajai project will be carried out	Tapajai project will not be carried out
		Consider planned roads : Roads to Nassau, road to hydropower Grankriki, road to Tapajai project	Consider planned roads: Road to Nassau
		Roads to Tapajai project has a width of 20meters	---
Urban area		The four development areas with a buffer of 5km are considered: Apoera, Atjoni, Stoelmanseiland and Snesikondre.	Idem
Protected areas		Deforestation may occur in the (existing and proposed) protected areas.	It is assumed that deforestation will not occur in the (existing and proposed) protected areas.
General info		The deforestation rate used is the highest rate, estimated from the historical period (2000-2015).	The deforestation rate used is the mean rate, estimated from the historical period (2000-2015).
		The first 5 years (2015-2020) use the BAU trend. After 2020 the Development considerations impact the occurrence of deforestation.	The first 5 years (2015-2020) use the BAU trend. After 2020 the REDD+ considerations impact the occurrence of deforestation.

Table 3. Overview of the development projects included in the projected development scenario and the Development with REDD+ scenario. *Source: Own elaboration*

The scenarios were simulated from 2015 till 2035, with an interval of 5 years in between. For the first five years (2015-2020), each scenario used the BAU assumptions considering that if there are new policies and measures, the effects will be reflected after those 5 years.

In figures 6, 7 and 8 the results for each scenario are shown, following the legend below:

Deforestation map 2015



Simulated deforestation map 2015-2035 (BAU scenario)

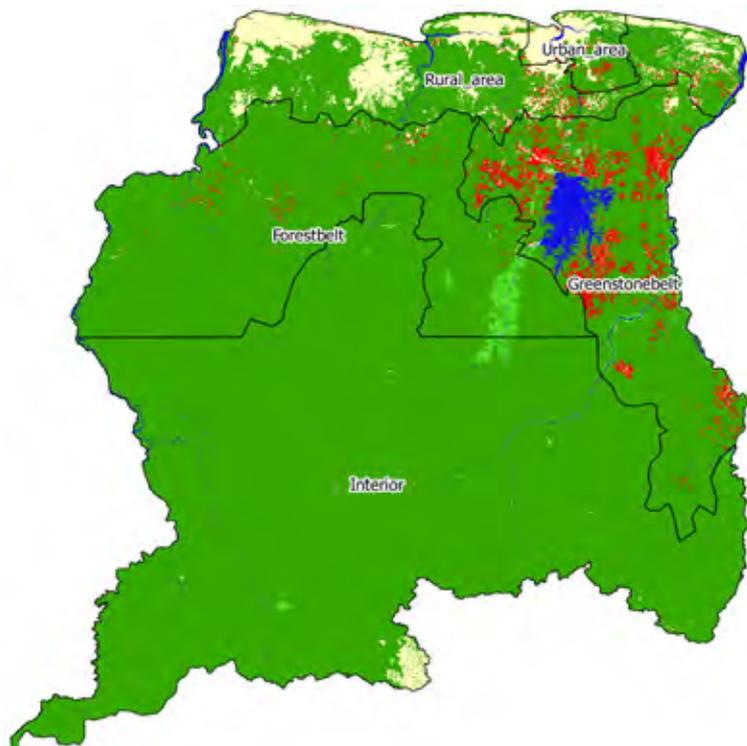
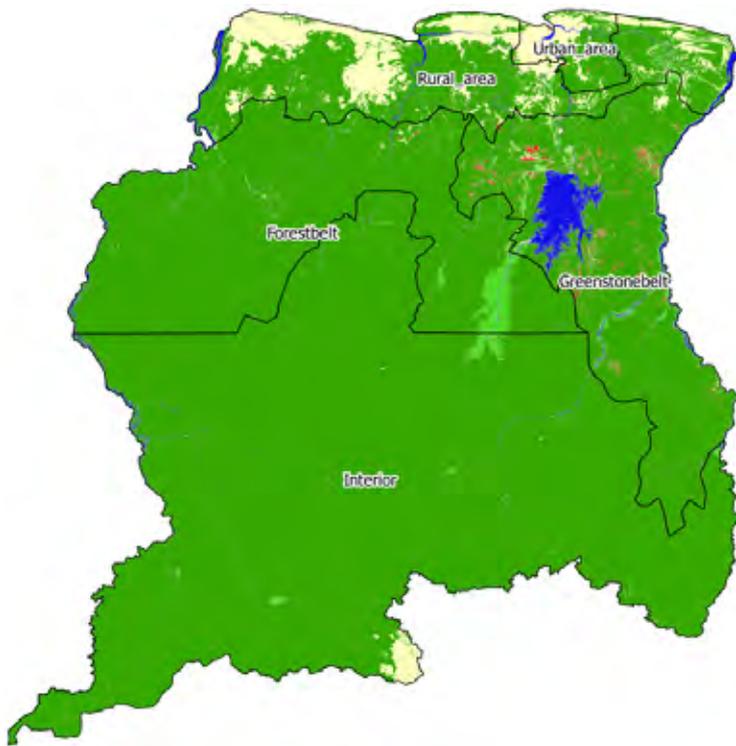


Figure 6. Results of the BAU scenario for the period 2015-2035.

Source: Own elaboration

The results of the BAU scenario for the period 2015-2035 shows that the deforestation continues with the same trend, expanding the actual deforested areas. The deforestation mainly increased within the Greenstone belt due to the gold mining activities. The deforestation area for the period 2015-2035 is 407,772 ha.

Deforestation map 2015



Simulated deforestation map 2015-2035 (projected development scenario)

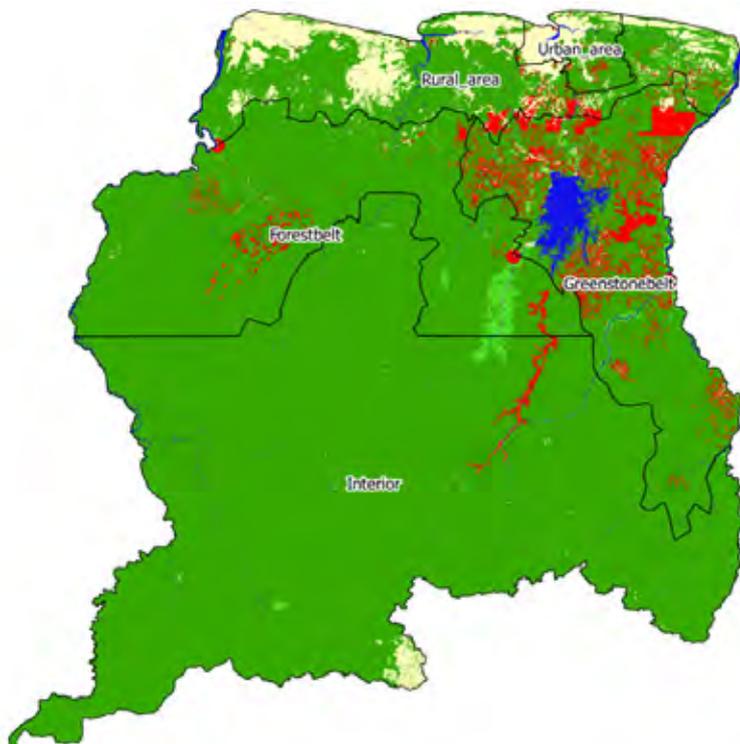
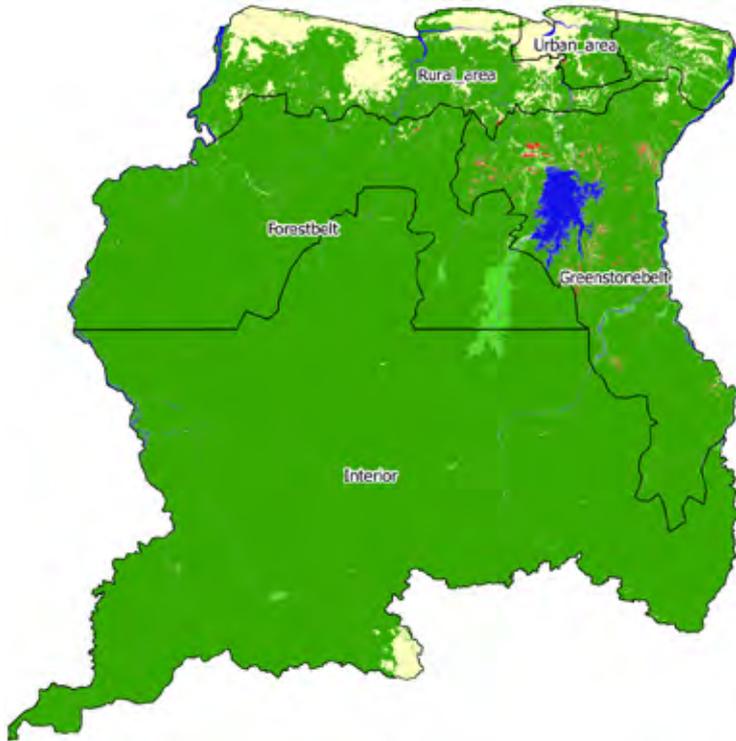


Figure 7. Results of the Projected development scenario for the period 2015-2035.
Source: Own elaboration

The results of the projected development scenario for the period 2015-2035 shows that the deforestation increased, due to the execution of all the planned oil palm projects, the Bakuys Project, the Nassau mining concession including the Grankriki hydro power dam and execution of the Tapajai project. The deforestation in the Greenstone belt is also increasing, mainly due to the gold mining activities in this sub-region. The total deforestation of the projected development scenario is 656,290 ha.

Deforestation map 2015



Simulated deforestation map 2015-2035 (Development with REDD+ scenario)

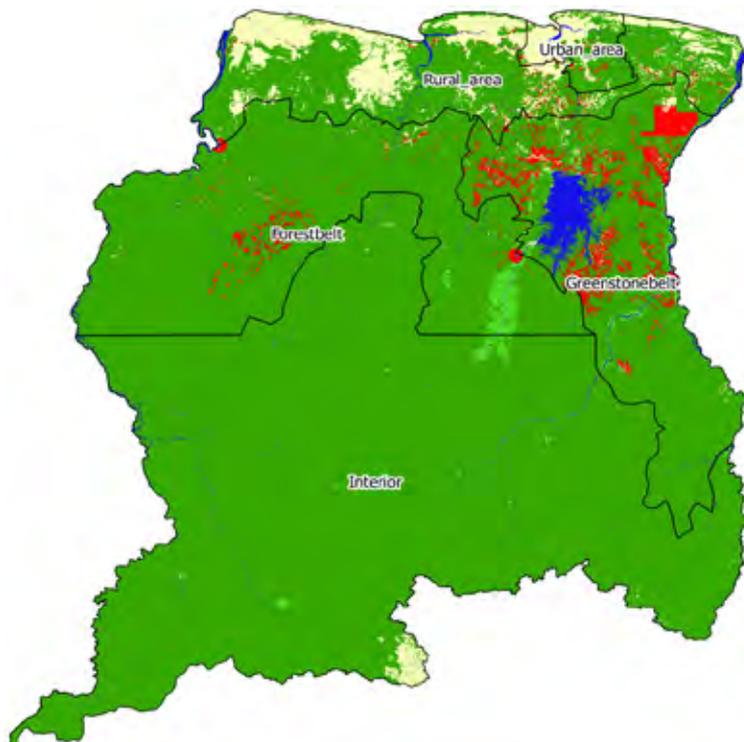


Figure 8. Results of the Development with REDD+ scenario for the period 2015-2035.
Source: Own elaboration

The results of the Development with REDD+ scenario for the period 2015-2035 shows that there is less deforestation compared to the Projected development scenario. This result is due to the assumption that not all the oil palm projects will be developed. The total deforestation of the Development with REDD+ scenario is 400,267 ha.

To measure the uncertainty of the future simulations we use the results from the validation phase (Figure 5), besides, a spatial index of certainty of future deforestation was constructed. This index overlaps the three future scenarios of deforestation simulated in the period 2015-2035, using the scale of High (areas with deforestation in 3 of 3 scenarios), Medium (2 of 3 scenarios) and Low (1 of 3 scenarios) certainty of deforestation, as well as forest with high certainty of conservation (Figure 9). In the Forest belt region, there are massive forest areas with low and medium certainty of deforestation, those areas depend on the execution of the Development Plan of Suriname, which has planned some gold mining areas and bauxite mining with the construction of a hydropower dam. In the Greenstone belt region, the tendency is the same that was observed during the last years, with increasing deforestation rates in the gold mining concessions. There are other projects, like the planned oil palm industries described in the Development Plan, that could increase the deforested areas even more. In the Rural and Urban areas regions deforestation is less extensive, concentrated in the previous deforested fronts, close to roads, urban areas, and agricultural fields.

Conclusions from the process and next steps

The future simulation of land use changes is a useful tool to locate policies, actions and measures (PAM's) for every region with certainty of deforestation. PAM's were developed depending of the sector that is involved on the cause of deforestation, which also could be related with the drivers identified in DINAMICA-EGO. Logging concessions, Land use planning, Agriculture and Mining are identified as sectors for implementing the PAM's, which can be located according to the potential drivers of deforestation found for every region with the weights of evidence analysis. Protected areas were also identified as another PAM, which could be useful to control the deforestation process in some areas with high certainty of deforestation.

The areas with high certainty of deforestation, according to the overlapping analysis, represent 13% of all deforestation simulated in the period 2015-2035 for the three scenarios (Figures 6, 7 and 8). Translated to area, under any simulated scenario there will be possible to locate at least 2,040 sq. km. of forest areas with high certainty of deforestation in the future. Those areas could be identified as pilot areas for the implementation of PAM's.

During different consultations and technical meetings with relevant stakeholders, where the results of the scenarios were presented, the following issues for discussion were raised:

- The demarcation of the communities in the interior, where the deforestation trend could be different
- Consider the possible land loss due to climate change related sea level rise.

To solve these issues and take them into account, the next step will be to contact the relevant stakeholders again and have bilateral meetings. After the land use change models have been executed again, there will be a next meeting with the stakeholders to present them the new results and get their feedback on it.

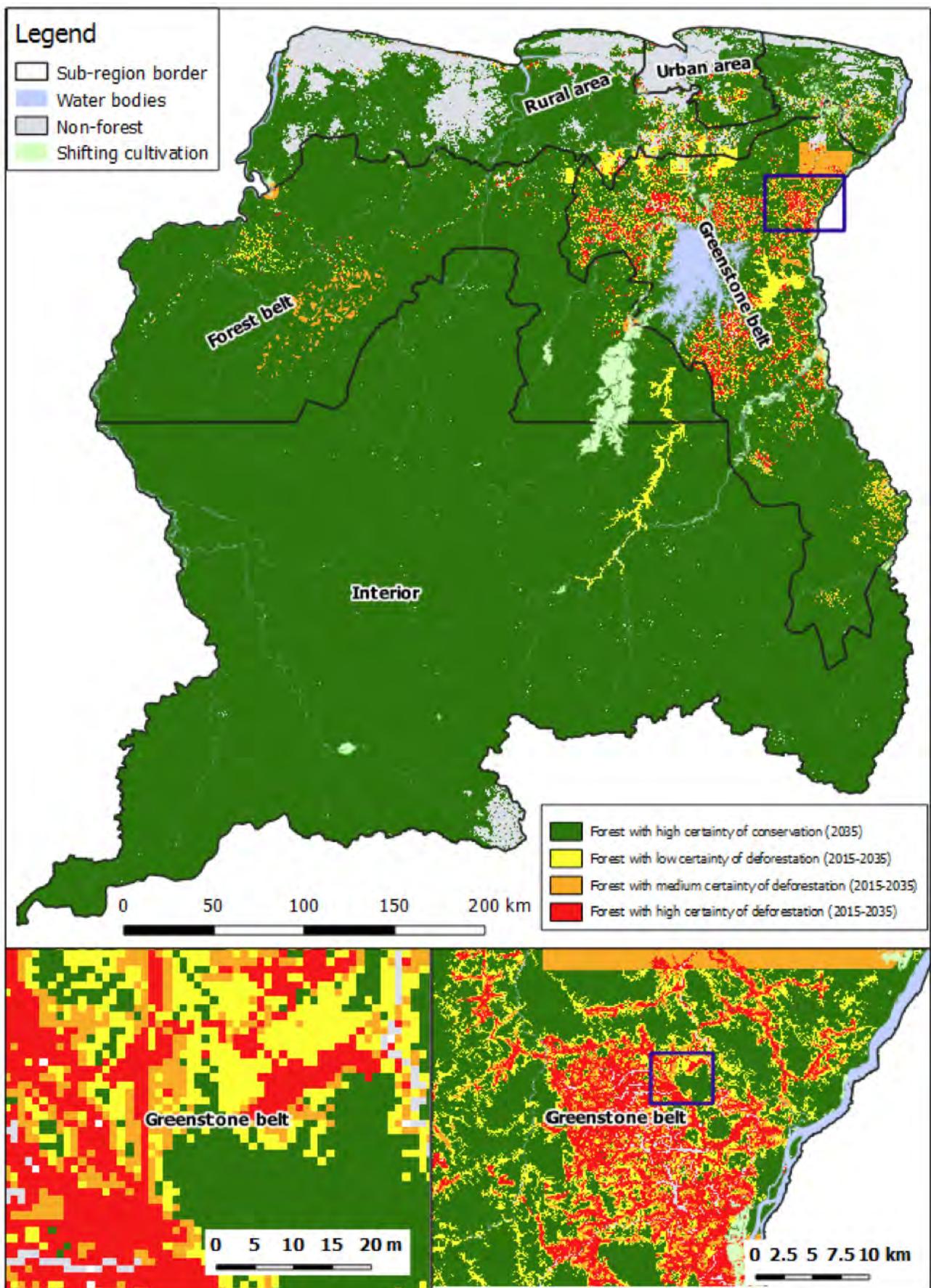


Figure 9. Spatial distribution of the certainty of deforestation in Suriname (2015-2035). Three different scales show the complexity of the simulated deforestation process. According to the figure, the borders of the isolated forest areas will have a high certainty to be deforested in the future. *Source: Own elaboration*

4. STAKEHOLDER ENGAGEMENT

Background

With about 65.000 Indigenous and Tribal Peoples living in the interior forests of Suriname, stakeholder engagement is indispensable in the development of forest-related policies, such as REDD+.

The Republic of Suriname has recognized this, as is reflected in the country's Stakeholder Engagement Strategy for REDD+ Readiness (Smith 2016), whose development included an in-depth stakeholder analysis and stakeholder mapping exercise.

The term "engagement" encompasses different types of interaction with stakeholders, including information-sharing and capacity building (Type A), joint analysis of issues (Type B), negotiation, consensus-building and consent (Type C) and finally the passing-on of oversight and monitoring roles (Type D, Diamond 2013).

Stakeholder engagement prior to the development of the national REDD+ strategy

Stakeholder engagement on REDD+ started in 2009 when the Government of Suriname decided to prepare a Readiness Preparation Proposal (R-PP) for submission to the Forest Carbon Partnership Facility (FCPF). In parallel, some stakeholder activities took place that are of relevance in the context of REDD+, although their original focus may have been different. The following table summarizes REDD+ relevant stakeholder activities that happened prior to this consultancy or are ongoing in parallel to this consultancy.

The review of these activities helped understand the entry point for stakeholder engagement as part of the development of the national REDD+ strategy. It also helped identify information gaps and further issues to consult on.

What & when	Organisations involved	Sources
REDD+ information session with tribal and indigenous communities, walk-in schools and project board meetings at several occasions and in several locations over the past years.	NIMOS REDD+, SBB, RAC, other REDD+ stakeholders	Reports available via NIMOS PMU and/or REDD+ website
Participatory mapping and modelling to document the land use and concomitant dependency of local communities on forests, Jan-Nov 2012, involving 191 community members from five indigenous villages in Southern Suriname (Sipaliwini, Pelelutepu, Palumeu, Apetina, Kawemhakan). Context: conservation planning.	CI Suriname, University of Utrecht, Tropenbos International	Ramirez-Gomez et al., 2013, 2016 & 2017; CTA 2016; TBI 2017.
Stakeholder engagement during R-PP development phase, Oct 2012 – Mar 2013.	R-PP coordinator and other partners	Reports available via NIMOS PMU and/or REDD+ website

What & when	Organisations involved	Sources
Activities as part of the project “REDD+ for the Guiana Shield”, 2013-2015, aiming at establishing a regional and technical platform for developing REDD+ in the Guiana Shield. More focused on stakeholders at decision-making and technical implementation level.	Coordinated by Office National des Forêts (ONF) of French Guiana in collaboration with ONFI (France), GFC (Guiana), IEF (Brazil), SBB (Suriname)	Website and leaflet
Engagement activities carried out to prepare the NFMS Roadmap: Status and Plans for Suriname’s National Forest Monitoring System throughout 2016.	Coordinated by SBB with support of the REDD+ project	An overview is included in the NFMS roadmap
<p>In Feb 2016, 18 Saramaccan community representatives from the Brownsweag and Upper Suriname River met with key stakeholders and policymakers to share results of a two year process to visualise and document their traditional environmental knowledge over a vast area (stakeholder mapping).</p> <p>In 2009/2010 similar activities were carried out by the Ministry of Regional Development/ACT under the project name SSDI - Sustainable Development of the Interior.</p>	Tropenbos International, WWF Guyanas, Association of Saamaka Authorities, UNDP GEF and CTA (Technical Centre for Agricultural and Rural Cooperation	Website including video
REDD+ refreshment training provided for the REDD+ assistants (RAC) in Feb 2016, Colakreek. In July 2016, in Berg-en-Dal, 3-day training for REDD+ Assistants building the RAC to agree on their terms of references and introduce to data gathering methods. October 2017, RAC training in Frederiksdorp.	NIMOS REDD+ Project Management Unit (PMU), supported by external facilitators such as Tropenbos International-Suriname	Reports available via NIMOS PMU. Report
Focus group discussions between Aug and Oct 2016 with about 34 stakeholders (out of a listed 93, 58 were invited and 34 attended) to do stakeholder mapping and stakeholder matrix and analyse position, interest, power, mandate, interactions etc of stakeholders in relation to REDD+ activities	CES Consultancy	Stakeholder analysis for engagement plan, prepared for NIMOS REDD+ team (Smith 2016)
3-day RAC training on local community perceptions and vision for the forest, drivers and barriers to REDD+ implementation, on how to conduct the surveys in the villages and on data collection methods, Oct 2016, then subsequent realisation of an analysis of community perceptions by RAC. Attended by all 18 members of the RAC, representing five different Maroon tribal communities and various Indigenous Peoples.	UNIQUE	NIMOS, SBB and UNIQUE (2017), page 174 & page 190 (data received)

What & when	Organisations involved	Sources
Numerous ongoing activities by REDD+ Suriname, including workshops, training sessions, etc.	NIMOS project in collaboration with Worldbank, CI, UN-REDD, WWF, Guiana Shield Facility (GSF) & UNDP Suriname	Facebook page and website
Ongoing activities within the Widening Informed Stakeholder Engagement for REDD+ (WISE REDD+) project, aiming at awareness building with government agencies, dialogues to increase understanding and engagement of IPs and tribal communities, REDD+ community capacity building and government capacity building	CI in collaboration with UNDP, NIMOS, the Climate Compatible Development Unit of the cabinet of the president and IP and Maroon representatives	WISE REDD+ website
Technical collaboration between different institutions and ministries to produce post deforestation land use/ land cover maps for 2000-2009, 2009-2013, 2013-2015	SBB in collaboration with min RO, LVV, RGB, HI, OW, NH, CELOS, GMD, SPS, MI-GLIS, Grassalco, OGS	www.gonini.org
Joint scenario modeling exercise: 5 day training; 1 day validation of calibration, 1 day validation of scenarios	SBB with support of consultant	REDD+ website or from SBB

Table 4. Some of the REDD+ relevant stakeholder activities.

Source: Own elaboration

Stakeholder engagement as part of the development of the national REDD+ strategy

Stakeholder engagement within the present consultancy took place as part of the development of the REDD+ Vision and Strategy and as part of its Strategic Environmental and Social Assessment (SESA, for more detail see specific SESA report). Overall, the engagement process consisted of a combination of stakeholder activities, including:

1. a national workshop;
2. community consultations and surveys; and
3. follow-up consultations with experts from different stakeholder groups.

The national workshop involved a large number of stakeholders from all REDD+ relevant stakeholder groups as identified by the PMU, including representatives from the government (inter-sectoral, involving a range of different ministries), district commissioners, traditional authorities of indigenous and tribal communities, academia, NGOs, community and youth organizations and the private sector. More than 120 stakeholders were invited and more than 100 attended the workshop.

The main aims of the workshop were to:

- Introduce to the development of the National REDD+ Vision and Strategy in general and its Strategic Environmental and Social Assessment (SESA) in particular;
- Understand issues and concerns in and beyond the forest sector and their impacts on Suriname's forests and forest-dependent communities pre-REDD+;
- Identify and assess enabling conditions for successful REDD+ implementation;
- Introduce to suggested REDD+ Policies and Measures;
- Identify potential risks and benefits of suggested REDD+ Policies and Measures;
- Categorize, evaluate and prioritize risks and benefits.

A gender baseline survey was also conducted at the national workshop in order to assess the status of knowledge and understanding of gender and equality in the context of REDD+.

Results of the workshop were used both in the development of the National REDD+ Vision and in the SESA. For further detail on the methodology of the workshop please see the methodology document (available with the programme management unit of REDD+ Suriname).

Community consultations and surveys were conducted by Tropenbos International (TBI) Suriname, an organization with a long and excellent track-record working with the Indigenous and Tribal Peoples (ITP) of Suriname on a range of different topics.

Between May and October 2017, TBI visited and consulted all of the 10 different indigenous and tribal communities. Due to their wide dispersal and varying remoteness, community consultations had to focus on selected villages for each community, i.e. not all villages could be included in the consultations. The selection was made based on several basic considerations. These were related to: the inclusiveness of all tribes; prior consultation and knowledge of REDD+; the presence of facilitators, especially through the REDD+ collective; in some cases the geographical distribution; also the logistical feasibility; and finally based on the guidance of the traditional authority. The below table (table 5) provides information on the ITP communities, their geographic distribution and the villages that were involved in the consultations.

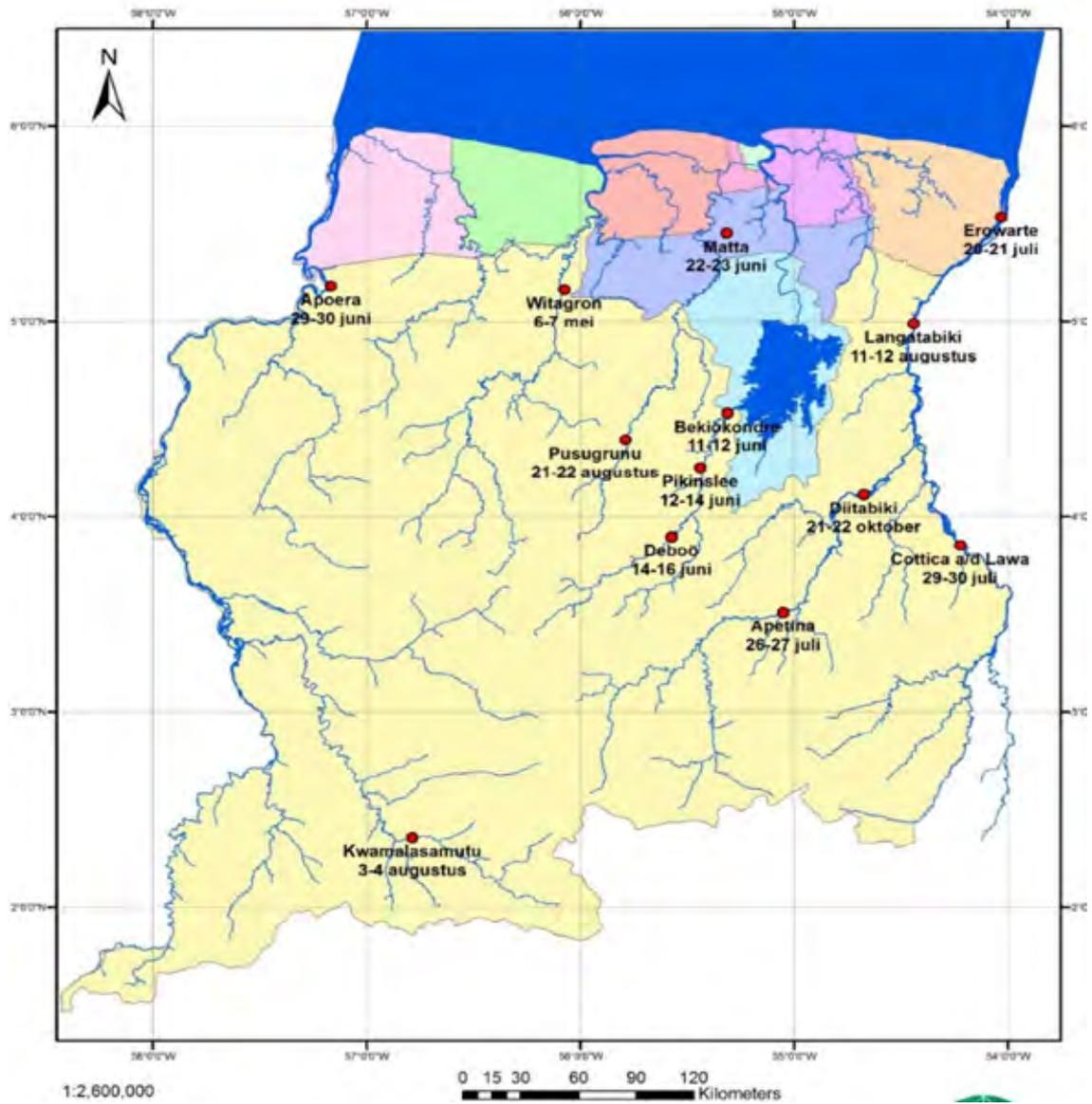


Figure 10. Map of villages where REDD+ National Strategy consultations took place with indigenous and tribal communities.
 Source: Tropenbos International-Suriname

Community	Villages	Estimated Population	Origin	Location	Consulted (with place where consultation took place in bold)
Kaliña	39	2.500	Indigenous	Spread over various villages, including mixed villages, in the savanna areas in the old coastal plain.	Langamankondre, Christiaankondre, Erowarte , Pierrekondre, Bigiston
Lokono	39	3.500	Indigenous	Spread over various villages, including mixed villages, in the savanna areas in the old coastal plain.	Matta , Cabendadorp, Hollandse Kamp, Witsanti. Apoera , Section, Washabo. Marijkedorp, Alfonsdorp
Trio	9	1.500	Indigenous	Southern to South-Western Suriname, spread over the southern part of the Sipaliwini district.	Kwamalasamutu
Wayana	6	650	Indigenous	Spread over the (east) Southern part of the Sipaliwini district, along the Tapanhony and Lawa Rivers.	Apetina
Saramaka	60 ¹² 24	25.000	Tribal	Area of the Upper-Suriname River; Brownsveg area and along the Afobaka road in the Brokopondo district.	1. Bataaliba area: Bekiokondre, Banavookondre, Pikipada, Baikutu, Duwatra. 2. Langu area: Kajana, Ligorio, Begoon, Deboö , Stonuku, Godowatra. 3. Pikinslee
Paramaka	13	4.000	Tribal	Along the upper-Marowijne River, bordering French Guiana.	Pikintabiki, Langatabiki, Nason, Sebedoe.
Aukaners/ Ndyuka	29 35	20.000	Tribal	Tapanahony River area, bordering French Guiana. Coastal plain of Northern Marowijne.	Diitabiki , Poeketi, Jawsa, Pikinkondre, Benanoe, Mainsi, Tabiki, Loabi, Adaisekondre, Malobie, Fandaakie, Mooitakie, Godoholo, Kisai, Granbori, Pipakondee, Sanbendoemie, Polokaba, Klementi.
Matawai	20	3.000	Tribal	Along the Upper Saramacca River.	Pusugrunu , Pieti, Padua, Wanhati, Betel and Sukibaka
Kwinti	2	500	Tribal	Upper Coppename River.	Witagron , Kaaimanston
Aluku	3	1.500	Tribal	Along the Lawa River, bordering French Guiana.	Cottica aan de Lawa , Boniville

Table 5. Indigenous and tribal communities of the Republic of Suriname their geographic distribution and villages consulted as part of the development of the National REDD+ Vision and Strategy of Suriname and its SESA.

Source: Own elaboration with information from Smith 2016, Ministerie van Regionale Ontwikkeling 2014

¹²According to Ministerie van Regionale Ontwikkeling (2014) there are 60 Saramaka villages in the Sipaliwini district (Upper Suriname River area) and 24 in the Brokopondo district. The consultations conducted as part of the present study focused on the Upper-Suriname River area.

Each visit consisted of two partly parallel processes, the actual workshop-like consultation and an additional survey, mostly conducted with community members who did not attend the workshops, with the aim to complement and triangulate information gained.

Topics covered in the community consultations and surveys include:

- A vision for the development of the village in the future;
- Social and environmental issues and their effects on livelihoods;
- Dependency on natural/forest resources and ecosystem services and trends in their availability;
- Main sources of income and importance of ecosystem services as income opportunity;
- Drivers of deforestation and forest degradation and barriers to sustainable use of the forest;
- Linkages between selected Policies and Measures (PAMs) and drivers of deforestation and forest degradation;
- Potential risks and benefits of selected PAMs;
- Enabling conditions for selected PAMs.

Community consultations and surveys were conducted in a culturally sensitive way, using traditional procedures for communication, introduction and realization of consultations.

Particular attention was paid to capturing gender-specific views and concerns in recognition of the specific role women play in forest-dependent communities with regards to access to and dependency on natural resources and ecosystem services. Gender specific conclusions were derived and recommendations developed accordingly, which are included in the SESA report and ESMF.

Information gained from the national workshop and community consultations were used in the development of Suriname's REDD+ Vision and in the SESA process. Important insights into social and environmental considerations were incorporated directly into the National Strategy documents in the form of social and environmental considerations for the different measures.

Parallel to the SESA consultation, follow-up consultations were conducted with different stakeholders (see Table 6 below), as needed.

Counterpart group	Acts as the core group of national government stakeholders guiding the process of developing the strategy. Consists of NIMOS/PMU, SBB, Ministry of ROGB, Office of the President Coordination Environment, Planning Office Suriname, and Ministry of Finance.
Key government institutions	Group of government institutions related most to the selected PAMs. Ministry of Finance, Ministry of Natural Resources, Ministry of Regional Development, Ministry of Trade, Industry and Tourism, Ministry of Public Works, Transport and Communication, and Ministry of Agriculture, Animal Husbandry and Fisheries.
Key non-government stakeholders	Group of non-government institutions related to key focus areas. These consists of representatives of the private sector (mining and logging), academia, civil society (NGO's and ITP organizations). See appendix for full list
Experts	Topic specific experts (individuals). See appendix for full list
Technical group	Technical group of stakeholders, led by national counterpart SBB in the scenario modeling process. This group is formed by the technical people of the Ministry of ROGB, Planning Office Suriname, Spatial Planning Association Suriname (SPASU), GMD, Ministry of Public Works, Transport and Communication, Ministry of Natural Resources, Ministry of Agriculture, Animal Husbandry and Fisheries, University of Suriname.
National stakeholders group	Larger group of representatives from all stakeholders, including government, private sector, civil society, local communities.

Table 6. Stakeholder categories.

Source: Own elaboration

These follow-up consultations were conducted in different phases of the development of the National REDD+ Vision and Strategy and its accompanying SESA as described in the following:

Scoping phase

In creating the PAMs, the existing policies, laws and regulations, the context of the drivers as well as of the current institutional arrangements needed to be clarified. Also, to gain insights in the financial context and programs in the forest sector, as input for the development of the financial strategy. For this purpose, in addition to the relevant documents, targeted consultations were done with key government institutes and non-government stakeholders.

Framing phase

In the framing phase, key expert on the field of REDD+ were consulted through one-on-one interviews to get their views and a sense of direction for both the development of the REDD+ Vision and the relevant strategic lines, as well as the implementation framework. Key topics were the development objectives and priorities of REDD+, the priority drivers to be addressed, scope of REDD+ activities, scale of REDD+, financial strategy and the approach to implementation.

Formulation phase

In this phase, the REDD+ Vision, strategic lines and relevant PAMs were determined. This was done together with the Counterpart group through group discussions. Key topics were the comprehensiveness of the strategic lines, and the coherence, effectiveness and completeness of the proposed PAMs. Information gathered from national and local level stakeholders during the SESA process contributed to the formulation of Suriname's REDD+ Vision.

Scenarios

In a parallel process, the development of the scenarios took place. This process was executed in collaboration with the national counterpart SBB. The Technical group was formed to serve as a technical counterpart group. This process was initiated by a training in the program used for scenario modeling (DINAMICA). After the model was developed together with SBB, a calibration workshop of the model followed with the Technical group. The scenarios were developed with SBB, after which the Technical group was again consulted during a validation workshop of the scenarios.

Validation phase

In this phase, the proposed PAMs were discussed with key government institutions and key non-government stakeholders. This was done through one-on-one meetings and written feedback. The aim was to get insight into the completeness of the proposed PAMs and the feasibility of their implementation by linking them with existing and planned programs and identifying key challenges. Also, the priority areas were identified which are linked to the implementation framework. And finally, key social and environmental considerations identified through the SESA process by national and local level stakeholders in the context of potential REDD+ risks and benefits of different PAMs were incorporated and linked to ESMF. Some of these one-on-one meeting were carried out by AAE, while the REDD+ Project Management Unit took over the process throughout 2018. The National REDD+ Strategy for Suriname, including the proposed PAMs, background document, SESA, ESMF and Financial Strategy will be formally validated by all stakeholders in a national validation workshop, planned for 2018.

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