



INCEPTION REPORT: BACKGROUND STUDY FOR REDD+ IMPLEMENTATION: MULTI-PERSPECTIVE ANALYSIS OF DRIVERS OF DEFORESTATION, FOREST DEGRADATION AND BARRIERS TO REDD+ ACTIVITIES

Strengthening national capacities of Suriname for the elaboration of the national REDD+ strategy and the design of its implementation framework

Inception Report:

Background study for REDD+ implementation: Multi-Perspective Analysis of Drivers of Deforestation, Forest Degradation and Barriers to REDD+ Activities

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Client

National Institute for Environment and Development in Suriname (NIMOS) and the Foundation for Forest Management and Production control (SBB)

Author

UNIQUE forestry and land use

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Cover photo: The Rosebel Gold Mine (jointly owned by IAMGOLD and the Government of Suriname) in the Brokopondo District

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LIST OF ABBREVIATIONS

ACR	American Carbon Registry
A/R	Afforestation and reforestation
CCD	Climate Compatible Development
CELOS	Center for Agricultural Research in Suriname
CoP	SBB Code of Practice
DDFDB+	Drivers of Deforestation, Forest Degradation and Barriers to REDD+
ESIA	environmental and social impact assessments
FAO	Food and Agriculture Organization of the United Nations
FCMU	SBB's Forest Cover Monitoring Unit
FCPF	Forest Carbon Partnership Facility
FPIC	Free, Prior and Informed Consent
FREL/FRL	Forest Reference Emission Level/Forest Reference Level
FSC	Forest Stewardship Council
FSC-CW	Forest Stewardship Council, Control Wood
GoS	Government of Suriname
ha	hectare
HFLD	High Forest cover, Low Deforestation rate
IDB	Interamerican Development Bank
IDCS	Investment and Development Corporation Suriname N.V.
IIRSA	Initiative for the Integration of the Regional Infrastructure of South America
IMF	International Monetary Fund
INDC	Intended Nationally Determined Contribution
LBB	Dienst 's Lands Bosbeheer
LVV	Ministry of Agriculture
MUMA	Multiple-Use Management Areas
NIMOS	National Institute for Environment and Development in Suriname
NCCPSAP	National Climate Change Policy, Strategy and Action Plan
NS	REDD+ National Strategy
OGS	Presidential Commission to Regulate the Gold Sector
OP	Meerjaren Ontwikkelingsprogramma
PA	Protected Area
PMU	Project Management Unit
PRODOC	Project Document
RAC	REDD+ Assistants Collective
ROS	Republic of Suriname

REDD+	Reducing Emissions from Deforestation, forest Degradation, sustainable management of forests, conservation of forest carbon stocks and enhancement of forest carbon stocks
RGB	Ministry of Physical Planning, Land- and Forest Management
R-PP	Readiness Preparation Proposal
SBB	Foundation for Forest Management and Production Control (<i>Stichting voor Bosbeheer en Bostoezicht van Suriname</i>)
SBSTA	Subsidiary Body on Scientific and Technological Advise
SCF	Suriname Conservation Fund
SIS	Safeguard Information System
SFM	Sustainable Forest Management
SMGM	small and medium-scale gold mining
Stinasu	Foundation for Nature Conservation in Suriname
UNDP	United Nations Development Programme
USD	United States Dollars
WRI	World Resources Institute

1 INTRODUCTION

On August 1, 2016, the National Institute for Environment and Development in Suriname (NIMOS) contracted UNIQUE forestry and land use GmbH to carry out the study: *Background Study for REDD+ in Suriname: Multi-Perspective Analysis of Drivers of Deforestation, Forest Degradation and Barriers to REDD+ Activities* (hereinafter referred to as the “DDFDB+ Study”). The study falls within the framework of the REDD+ Readiness project “*Strengthening national capacities of Suriname for the elaboration of the national REDD+ strategy and the design of its implementation framework*” of which NIMOS and the Suriname’s Foundation for Forest Management and Production Control (SBB) are partners.¹

This inception report refines the methodological approach proposed, outlines the detailed work plan, and provides the findings of the study’s Task 1. The reasoning behind providing the results of Task 1 already early on in this inception report is to allow for the opportunity for the consultant team to receive feedback at this preliminary stage, taking into account that Task 1 is meant to provide a guiding basis for the remainder of the study.

Given the importance of completing the assignment by December 31, 2016, this report’s work plan indicates the deadlines and responsibilities of the numerous parties involved. Strict adherence to these timelines by all parties will be necessary for the successful delivery of the products within the allotted time. Therefore, this inception report provides the critical opportunity early on in the assignment for the consultant team and client to harmonize their calendars of activities and agree on collaboration approaches. It is important to note that the REDD+ Stakeholder Engagement Plan is currently being designed. The lack of this Engagement Plan poses certain constraints to the consultants’ work because the stakeholder consultations should ideally begin to take on a strategic element in that sense that the key stakeholders that will play a role in REDD+ implementation should receive clear and consistent messages from the Government of Suriname. The ability of the consultant team to carry these messages is limited, as the REDD+ strategy is currently under development.

1.1 Background: DDFDB+ positioning in Suriname’s REDD+ process

Suriname has been engaged as a Forest Carbon Partnership Facility (FCPF) Participant Country since 2009. In 2013, Suriname finalized its REDD+ Readiness Preparation Proposal (R-PP), which was approved by the FCPF Readiness Fund, allowing the country to receive a USD 3.8 million grant. As Suriname’s designated FCPF delivery partner, the United Nations Development Programme (UNDP) elaborated a Project Document (PRODOC) which details how the FCPF Readiness funds will be used. The PRODOC aims to achieve the important REDD+ objective of REDD+ being recognized as a strategic lever at the heart of Suriname’s vision for development and the post-2016 national development strategy (UNDP 2014).

As a key institution with strong political linkages embedded in the Cabinet of the President, NIMOS has been appointed as the focal point for REDD+ in Suriname, responsible for PRODOC implementation and stakeholder coordination. NIMOS is currently in the process of developing

¹ For more detailed information on REDD+, see Suriname FCPF Country page: <https://www.forestcarbonpartnership.org/suriname>.

a National Strategy (NS) for REDD+ in Suriname. This DDFDB+ Study will provide key information and initiate the national dialogue required for NS development.

According to recent decisions taken under the United Nations Framework Convention for Climate Change (UNFCCC), national REDD+ strategies or action plans must be developed in a way that addresses the drivers of deforestation and forest degradation, barriers to sustainable forest management, conservation and enhancement of carbon stocks.² Considering the development of REDD+ strategies must be participatory and based on an inclusive engagement process, this DDFDB+ Study provides an important opportunity to engage stakeholders very early on in the NS development process, allowing key stakeholders the time to process information about REDD+ and develop their ideas about how REDD+ can best contribute to Suriname's climate compatible development approach (ROS, INDC 2015).

1.2 Study objectives

The overall objective of the DDFDB+ study is to identify crucial challenges and main points for improvement related to drivers of deforestation and forest degradation in Suriname, as well as to barriers for sustainable management of forests, conservation of forest carbon stocks and enhancement of forest carbon stocks. The study will provide the main background analysis for REDD+ NS development, the development of the National Forest monitoring System (NFMS), Forest Reference Emission Level (FREL) and Forest Reference Level (FRL), Strategic Environmental and Social Assessment (SESA) and Safeguard Information System (SIS) in Suriname.

Specific objectives of the overall study are:

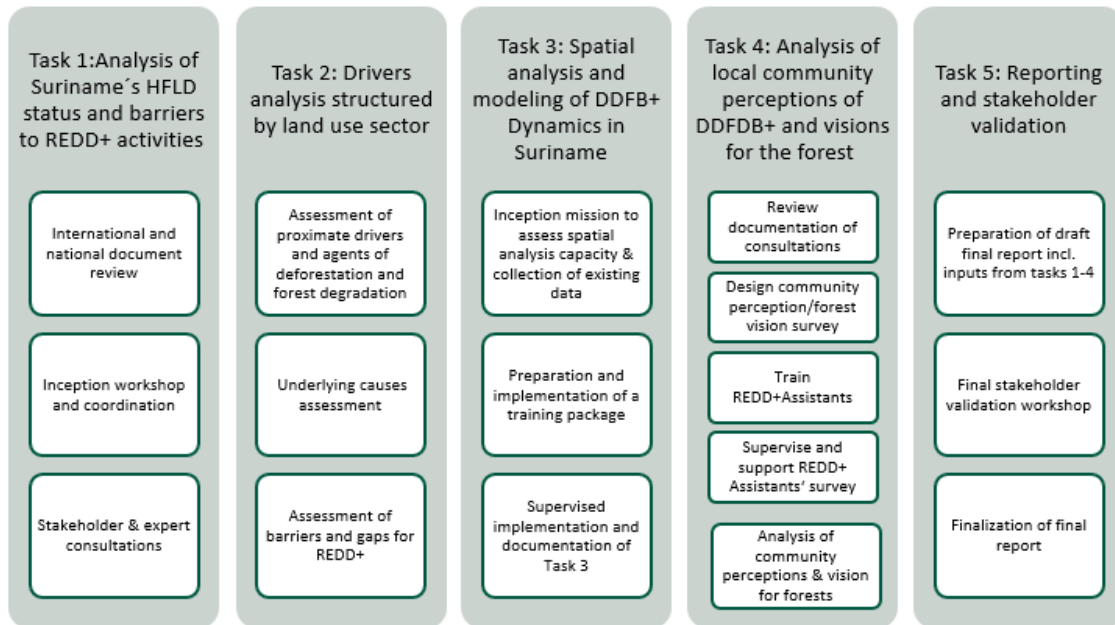
- o Explanation of Suriname's high forest cover and low deforestation (HFLD) status to better understand how Suriname can follow a development pathway that does not compromise its HFLD status moving forward;
- o Deeper knowledge about the direct and underlying drivers of deforestation and forest degradation linked to each land-use sector in Suriname and interactions between them;
- o Determination of the relative significance of drivers in terms of greenhouse gas emissions, with respective spatial disaggregation;
- o Analysis of local community perceptions of drivers and barriers, and their vision for the forest.

² According to Paragraph 71 of decision 1/CP.16, national REDD+ strategies are highly dependent on national circumstances; <http://redd.unfccc.int/fact-sheets/national-strategy.html>.

1.3 Overview of Tasks

To achieve these objectives, the study is comprised of five key tasks, shown in Figure 1.

Figure 1 Overview of DDFDB+ Study Tasks and Activities



Task 1 aims to provide an overview of the state of Suriname's forests, explaining the current status in relation to the five REDD+ eligible activities³ and explain why Suriname has so far maintained a high forest cover and low deforestation (HFLD) status. Task 1 provides the basis for the assessment in Tasks 2-4.

The objective of **Task 2** is to prepare a structured analysis of the historical and expected potential proximate and underlying causes of deforestation and forest degradation and an assessment of barriers and gaps for REDD+ as well as to get an insight into the relative importance of drivers in terms of GHG emission.

The objective of **Task 3** is the coaching and continuous supervision of the identified staff in SBB's Department of Research and Development, especially the Forest Cover Monitoring Unit (FCMU) and GIS unit, enabling them to perform the spatial analysis for this study in a way that prioritizes capacity building and strengthening institutional memory. In close cooperation with local spatial experts, the land use cover changes and estimation of historical GHG emissions due to deforestation and forest degradation and other forest dynamics will be quantified.

The objective of **Task 4** is to support the assessment of drivers of deforestation and forest degradation through the gathering and understanding of the local communities' perceptions on drivers and their vision for the forests.

Task 5 will bring together the key findings of the previous four Tasks in a comprehensive way that explains the cumulative knowledge generated throughout the assignment. Task 5 also entails a broad stakeholder engagement exercise, where the diverse stakeholders consulted during

³ i) reducing emissions from deforestation, ii) reducing emissions from forest degradation, iii) conserving forest carbon stocks, iv) sustainable forest management, and v) enhancing forest carbon stocks

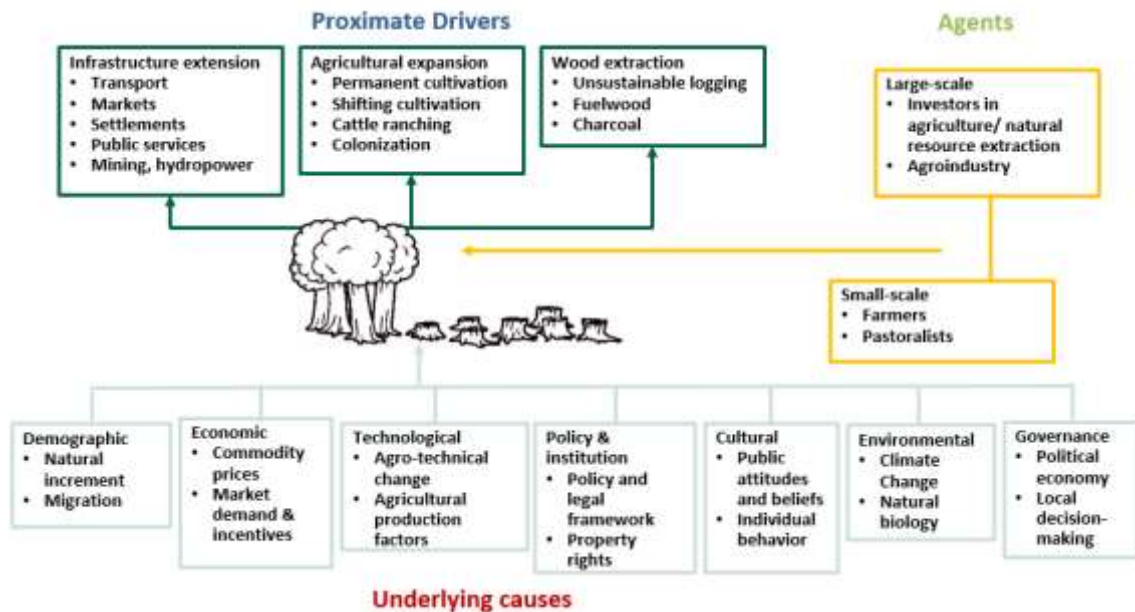
this assignment will be gathered. The main findings will be presented and all stakeholders will be given the opportunity to provide feedback to further improve the analysis. This task also serves to further build national capacity and understanding of the REDD+ NS process in a way that contributes to consensus building on the main drivers to be addressed by the REDD+ NS.

2 BACKGROUND TO DRIVERS OF DEFORESTATION, FOREST DEGRADATION AND REDD+

The dynamics of deforestation are complex and not easily reduced to a single factor or linear explanations. The variability of actors, situations and relationships calls for localized analysis in forested areas. However, deforestation finds its root causes in global trends and drivers are often found 'outside the forest.' When analyzing drivers, a balance needs to be struck between a number of important variables. Geist & Lambin's (2001,2002) archetypal work on proximate drivers, underlying causes and agents (depicted in Figure 2). arguably remains the key point of reference for those seeking to understand the dynamics of deforestation. While paying heed to the invariable complexity of tropical forest decline, this often-cited figure systematically illustrates the possible proximate drivers and causes underlying deforestation, dividing them into easily-understandable categories.

Proximate or direct drivers of deforestation and forest degradation are human activities and actions that directly impact forest cover and result in the loss of carbon stocks. As shown in Figure 2 below, these drivers are commonly grouped into general categories, including i) agricultural expansion, such as commercial agriculture, shifting cultivation or cattle ranching; ii) wood extraction, e.g. through unsustainable logging or charcoal production, and iii) infrastructure extension, including settlement expansion, transport infrastructure, or mineral extraction. Underpinning these proximate causes are underlying causes, a complex of economic issues, policies, and institutional matters; technological factors; cultural or sociopolitical concerns; governance; and demographic factors. Other issues associated with deforestation are predisposing land characteristics (for example, slope and topography), features of the biophysical environment (soil compaction, drought conditions), and societal trigger events, such as social unrest or refugee movements (*ibid.*).

Figure 2 Conceptual framework: Examples of proximate drivers, agents and underlying causes



Source: adapted from Geist and Lambin (2001, 2002)

2.1 Proximate drivers and agents

Proximate drivers and agents are usually location-specific; thus, in order to address them effectively, policies and measures should be adopted that take this into account and allow for flexibility regarding different local circumstances. Agriculture is now recognized as the most important proximate driver for deforestation worldwide (Kissinger et al. 2012). Mining, infrastructure and urban expansion are important but less prominent at the global level. Increasing climate change impacts are also believed to become an important driver, e.g. reduced biomass as consequence of droughts and changing precipitation patterns and vulnerability to fire.

Forestry activities, i.e. timber extraction and fuelwoods production, are generally understood as the main proximate drivers of forest degradation. Degradation resulting from unsustainable and/or improperly planned forestry and infrastructure development may become the precursor for deforestation, as previously inaccessible forest areas are opened to a range of transient or permanent land users (Chomitz 2007).

Planned versus unplanned drivers

Planned deforestation and degradation activities are governmentally authorized activities that lead to deforestation. Avoiding planned deforestation refers to a REDD+ activity that reduces GHG emissions by stopping deforestation on forest lands that are legally authorized and documented to be converted to non-forest land, and enhances carbon stocks of degraded and secondary forests (if present in the programme/project area) that would be deforested in the absence of the project activity (ACR 2011). Note that illegal deforestation along a new legal road would be classed as unplanned deforestation. If resettlement schemes involve legal parcelization and legal ownership of land and clearance, this type of deforestation would be classed as planned. The avoidance is that the government takes its authoritative decision to do follow an

alternative development pathway, such as avoiding authorized deforestation, e.g. infrastructure project, or the Yasuni project where Ecuador tried to do avoiding oil drilling in this block of pristine rainforest, but did not get enough money from international community.⁴ Another option is if on private property, the REDD+ project developer has the right to deforest, but chooses otherwise.⁵ Some REDD+ countries have attempted to address planned deforestation via cross-sectoral land use planning. For example, Viet Nam is discussing a revision of the Land Use Planning bill and how to implement changes at different levels (i.e. provincial land use planning as well as at national level), as there are different competences and interests that need to be respected at various levels.

2.2 Underlying Causes

While the proximate drivers are relatively straightforward to quantify and to assess, their underlying causes result from the complex interactions of social, economic, political, cultural and technological developments, ultimately enabling the proximate drivers to unfurl. They act at and across multiple scales: international (e.g. commodity markets and price dynamics), national (e.g. economic development, population growth, domestic markets, national policies, governance) and local circumstances (e.g. livelihoods, poverty, unclear land tenure) (Kissinger 2012). In many REDD+ readiness plans, countries identify weak forest sector governance and institutions, lack of cross-sectoral coordination, and illegal activities (related to weak enforcement) as main underlying causes (WRI 2012). These factors are highly linked to the country's chosen approach to development. Thus, a sound understanding of the history of the country's development programs, policies, institutional set-up and their effectiveness is required.

This step seeks to assess how international influence and national context shape interests of key stakeholders potentially driving forest changes in Suriname. For the purposes of this methodology, concepts and tools from a range of literature on political economy analysis have been adapted.⁶ Political economy most commonly refers to an interdisciplinary approach to analyzing economics, law, and political science in explaining how political institutions, the political environment, and the economic system influence each other. Political economy can be used to better understand the impact of various external drivers (e.g. trade, international corruption, media pressure) on domestic governance and policy making. This includes the role that donors play as political actors, as well as providers of aid. In the context of this assessment, international factors affecting forest change may include:

- International trade and markets, i.e. commodity prices
- Regional economic or political arrangements
- Trade flows (both licit and illicit)
- Migration flows

⁴ For further background: <https://www.theguardian.com/environment/2016/apr/04/ecuador-drills-for-oil-on-edge-of-pristine-rain-forest-in-yasuni>

⁵ Example: <http://www.rainforest-alliance.org/business/climate/validation-verification/projects/ckbv-project>

⁶ See DFID's work on *Drivers of Change*, see <http://www.gsdr.org/docs/open/PO58.pdf> for an example of existing political economy methodologies.

- The role of donors and dependence on aid
- Influence of good governance initiatives or sectoral programs
- Global and local media

International factors affecting forest loss and change are usually considered underlying causes. External driving forces and their underlying elements are critical for understanding the trajectories, scale, and dynamics of land-use change. However, experience regarding how to systematically assess these underlying drivers and their relationship to and impact on proximate drivers remains limited.

The linkages between the different underlying causes and how this drives deforestation is complex. Methodologies for assessing underlying drivers are developed according to data availability and proxy-based approaches or qualitative assessments are often used. The feedbacks and interlinkages between the patterns of drivers, underlying causes, and agents within a given spatiotemporal domain are difficult to quantify, especially the causal relationships between direct and underlying drivers (Veldkamp & Verburg 2004). Land use and land cover change models demonstrate future impacts of internal factors (improvement of national transportation networks and infrastructure) and external factors (increasing global demand for agricultural commodities) but there are often limits to poor data reliability and robustness.

2.3 UNFCCC guidance on assessing drivers

Under the United Nations Framework Convention on Climate Change (UNFCCC), potential REDD+ finance recipient countries are encouraged to continue their work on drivers and to share the results of this work on the [UNFCCC REDD Web Platform](#). There is no official methodological guidance from the Subsidiary Body on Scientific and Technological Advice (SBSTA) on how to analyze and address the drivers.⁷ Therefore, the analytical frame for assessing drivers and developing REDD+ strategies is developed by individual REDD+ countries. Meanwhile, practitioners and scientists involved in quantifying emissions resulting from land-use change activities have proposed a range of conceptual models and alternative approaches to analyzing land-use change.

In the framework of REDD+ readiness, REDD+ countries have proposed various approaches to undertaking driver assessments. These assessments serve as crucial steps to developing national

⁷ According to the most recent draft conclusions of the chair of the Subsidiary Body for Scientific and Technological Advice (SBSTA) at the inter-sessional meeting in [Bonn from June 2013](#), the SBSTA recalled the guidance provided, requesting that: “developing country Parties, when developing and implementing their national strategies or action plans, to address, inter alia, *the drivers of deforestation and forest degradation*, ensuring the full and effective participation of relevant stakeholders, inter alia, indigenous peoples and local communities. It was noted that actions to address drivers should consider the guidance from UNFCCC Conference of the Parties (COP) 16 decision 1/CP.16, which requests developing countries to develop a national forest reference emission level (REL) and /or forest reference level (RL), or if appropriate, as an interim measure, subnational forest REL and/or RLs, in accordance with national circumstances and provisions in the COP 15 decision 4/CP.15 in 2010. The SBSTA further recognized the importance of cross-sector coordination in the context of the development of national strategies or action plans in addressing drivers of deforestation and forest degradation. The SBSTA further recognized that international cooperation can contribute to addressing drivers of deforestation and forest degradation. The SBSTA decided to recommend a draft decision on addressing the drivers of deforestation and forest degradation for adoption by COP 19 (the text of the draft decision is contained in FCCC/SBSTA/2013/L.12/Add.3).”

REDD+ strategies, implementation frameworks and establishing the FREL/FRL. The analytical work on drivers and FREL/FRL establishment must be closely coordinated as drivers' studies underpin the assumptions regarding the projections of future forest dynamics. If expected future developments differ from the observed historical trends in forest changes and emissions, these assumptions should be properly justified and supported by an explanation of drivers, agents and underlying causes. The underlying causes of forest change can be related to international (e.g. markets, commodity prices), national (e.g. population growth, domestic markets, national policies) and local (e.g. subsistence land-use patterns) circumstances. Therefore, in addition to data on historical forest area change and associated emissions, the development of forest RELs/RLs requires information on local and outside pressures and processes and their specific contribution to future national emissions. The recent Paris Agreement does not have more specific details relevant for drivers in the context of REDD+.

2.4 Assessing drivers of deforestation and forest degradation

In general, the range of methods and approaches developed for analyzing deforestation and the causes underpinning forest loss and degradation can be divided into two methodological categories: large-scale or top-down global or national-scale assessments whereby aggregated data is analyzed; and local-scale case studies investigating in detail the processes and dynamics of forest cover change in a given spatiotemporal domain. Drivers assessments can be further categorized according to time scale and objective: e.g. historical forest cover changes and its causes; or predicting and explaining future land cover changes.

The specific approach employed usually depends on the expertise of the 'drivers' assessor.' For example, geographers analyze time series of satellite images, economists employ econometrics, while social scientists and anthropologists employ participatory rural appraisal. Therefore, a multi-perspective interdisciplinary or even transdisciplinary (including non-academic science) methodology is preferred. Each approach comes with benefits and drawbacks: spatial analysis can quantify deforestation in spatial terms but may not be able to explain processes taking place underneath the forest canopy. Economic assessments allow for a better understanding of agents and underlying causes but rely heavily on accurate data, which is a challenge in many REDD+ countries. It should also be noted that this methodological heterogeneity and diversity in terms of scale and scope of assessments makes it difficult to draw cross-disciplinary conclusions and compare results between studies. Nonetheless, this study aims –to the best extent possible– to take a cross-disciplinary approach that builds on existing analysis in order to summarize the state of the knowledge regarding drivers in Suriname.

3 DETAILED METHODOLOGY

3.1 Overall methodology for implementation of the tasks

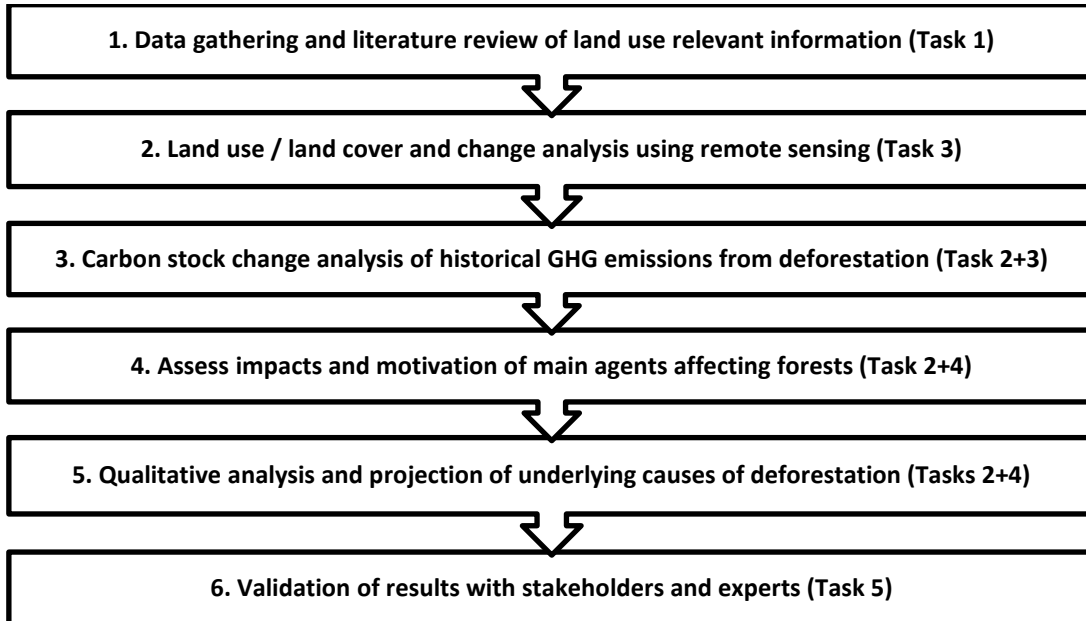
Suriname is a diverse country, both culturally and ecologically, and thus a careful approach needs to be adopted to ensure that the assignment can accurately reflect the country's diversity. Drivers of DFD can greatly vary at the local level, and thus this study will provide valuable insight into the dynamics of DFD and barriers to REDD+ activities in Suriname in their distinct contexts. Further, the study aims to project the impact of future dynamics on forest, keeping in mind that Suriname's historically low deforestation rate does not necessarily translate into future trends. While relevant studies have been carried out at the national and sub-national level, these have been mainly limited to spatial assessments based on available satellite imagery (e.g. Ramirez-Gomez 2011; Rahm et al. 2015; Crema & Brandao 2014). To ensure the DDFDB+ project truly addresses the immediate and underlying causes of DFD, a comprehensive and participatory assessment of the past, current and future expected drivers is required. The following approach, based on and in line with the TOR, was presented and discussed with key SBB and NIMOS staff members during a kick-off meeting held on September 6, 2016.

In our approach to identify crucial challenges and main points for improvements related to drivers of deforestation and forest degradation in Suriname, as well as to barriers for sustainable management of forests, conservation of forest carbon stocks and enhancement of forest carbon stocks, we propose to combine quantitative and qualitative data collection, using perspectives from bottom-up and macro-level analysis. Throughout the assessment, methodological triangulation, which involves using more than one method to gather data, such as informed judgments, expert interviews, gray and peer-reviewed literature, and non-published research will be employed. Information will be sought from as many sources as possible.

We propose a series of activities to achieve the assignment's objectives, reflecting the four core tasks in the TOR. Many of the activities are dependent on one another, and we note in the methodology the various interdependencies and synergies between the tasks. The following figure provides an overview of the suggested tasks and the key activities under each task.

The methodological approach depicted in Figure 3 entails a step-wise approach, but it should be noted that the activities comprising the numerous Tasks will be carried out in parallel. Conducting the Tasks simultaneously allows for continuous feedback and internal corroboration of the interim findings. Regular feedback and approval will be sought from SBB and NIMOS as appropriate.

Figure 3 Methodological approach for the systematic assessment of proximate drivers, agents and underlying causes of deforestation



This approach allows for a wide range of proximate drivers and agents to be identified as potentially relevant for the given vegetation type, both now and in the future, and thereafter goes into detail in order to assess the relevant importance of each of the proximate drivers, agents and underlying causes. Within this framework, we use a combination of methods to undertake a systematic driver assessment as further elaborated in this report. The steps proposed in this methodology employ simple tools that are transparent, replicable and understandable for a large set of stakeholders. While ensuring technical robustness and adherence to international best practice standards, the results from the proposed approach are easily communicable to policy makers and practitioners, including for those not yet engaged in REDD+. Further, the methodological tools are flexible in the sense that can be adapted according to data availability and robustness.

The detailed methodological approach is described for Tasks 1-5 below.

3.2 Analysis of Suriname's HFLD status and barriers to REDD+ Activities (Task 1)

Objective

Task 1 aims to provide an overview of the state of Suriname's forests, explaining the current status in relation to the five REDD+ eligible activities and explain why Suriname has so far maintained a high forest cover and low deforestation (HFLD) status. Further, the task aims to provide the basis for our assessment in tasks 2-4.

Task 1 guides the direction of the entire DDFDB+ study and the results inform the subsequent analysis and activities. Therefore, the preliminary analysis of Task 1 is presented early on in this inception report to allow the clients and key stakeholders to provide important feedback to guide the study. The methodological approach is based on two complementary activities:

Desk-based document review: The preliminary results of this task (detailed in Chapter 4 of this report) are based on an in-depth international and national literature review (see References at the end of this report for list of documents reviewed). The forest transition theory served as the guiding framework for the analysis of HFLD status. The desk-based review also provides key information for Task 2.

In-country mission: Stakeholder meetings and expert interviews were held with key actors during the 2-week inception mission carried out from September 5-15, 2016. The purpose of these meetings was to gather information to ensure that the most up-to-date and most relevant information is taken into consideration. Secondly, the meetings aimed at receiving feedback on the preliminary findings for Task 1. See Annex for further information regarding the stakeholder focus groups and bilateral meetings held.

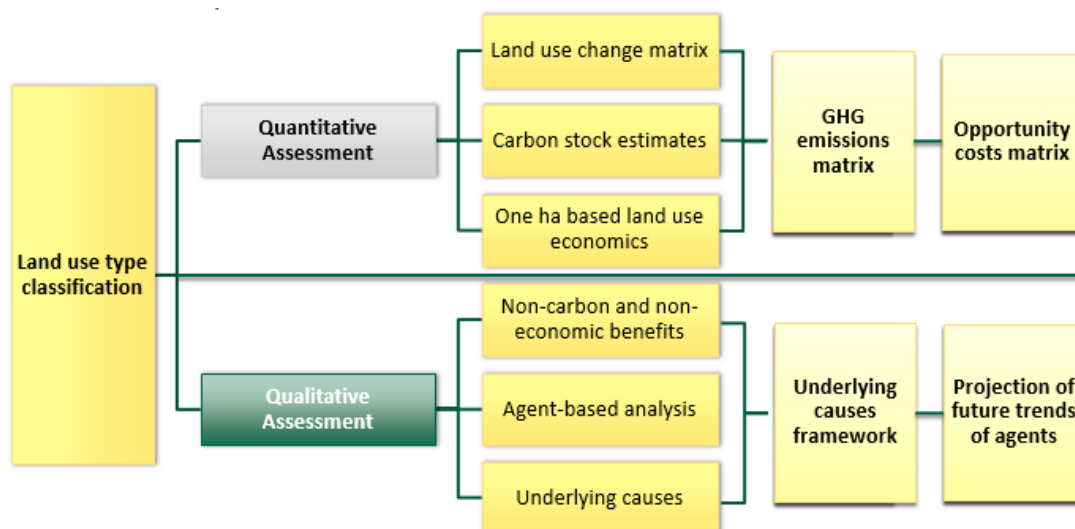
3.3 Sectoral drivers analysis (Task 2)

Objective:

The objective of this task is to prepare a structured analysis of the historical and expected potential proximate and underlying causes of deforestation and forest degradation and assessment of barriers and gaps for REDD+ as well as to get an insight into the relative importance of drivers in terms of GHG emissions.

Task 2 comprises the bulk of the analytical work carried out for this assignment. It combines qualitative and quantitative analysis of drivers, agents and underlying causes, as shown in Figure 4. For this Task, an interdisciplinary team of sector experts under the guidance of UNIQUE will jointly conduct the assessment. A variety of analysis tools are combined to ensure the comprehensiveness of the assessment. These are described in turn below.

Figure 4: Sectoral drivers analysis



Remote sensing analysis to develop a forest cover and land use land cover (LULC) map and land use change matrix quantifies area-wise impact and respective changes in the past (see Table 1). This serves as the basis for the proposed area-based approach whereby drivers and agents will be assessed in spatial terms (land use change matrix). Based on that we will be able to quantify the historical GHG emissions and emission reduction potential (avoided GHG emissions or carbon sequestered, depending on the data available). This will form the basis for attributing forest and woodland losses and emissions to different drivers and agents. For this step, we will build on the work completed or underway by the SBB’s FCMU. This ensures the land use classifications and maps produced are in line with national definitions and priorities. This analysis will be conducted under Task 3, described in section 3.4.

For the development of the land use change matrix, we will combine remote sensing with expert interviews and secondary data collection. For the land use classification, we will review available documentation regarding existing land use classification to build on work already undertaken, with specific focus on activities that impact forest cover. For example, the Center for Agricultural Research in Suriname (CELOS) currently had a PhD student working on a proposal to revise the national forest class typology in a way that allows for remote sensing to detect these classes.

Table 1: Example results of land use cover change analysis (Land use change matrix)

Land use class (2005)	2015					Total
	NF	FD	FP	AL	OL	
Dense Natural Forest (NF)	Yellow	Orange	Orange	Red	Red	
Natural Forest Disturbed (FD)	Green	Yellow	Orange	Red	Red	
Forest plantation (FP)	Green	Green	Yellow	Red	Red	
Agricultural land (AL)		Green	Blue	Yellow		
Other land (OL)		Green	Blue		Yellow	
Total						
	Orange	Forest degradation				
	Red	Deforestation				
	Green	Enhancement				
	Blue	Afforestation				
	Yellow	Unchanged				

Note: This example will be further refined and elaborated based on the relevant land uses classes in Suriname’s context. For example, SBB is currently not tracking forest gains through reforestation or natural regeneration using remote sensing.

Estimate historical GHG emissions due to deforestation and forest degradation: Use existing data on carbon stocks for different land cover types e.g. from the on-going but soon to be completed “State of the art study: Best estimates of emission factors and carbon stocks for Suriname,” carried out by CATIE. Depending on the data available, aboveground and belowground biomass (if possible soil carbon) should be included in the assessment, which is the major carbon pool of forest-related ecosystems. Gaps in data will be filled using IPCC default Tier 1 data, as necessary. Combining the steps above, the estimated historical GHG emissions due to deforestation and forest degradation for the different time frames, including the contribution of each individual land use, will be calculated.

Calculate Opportunity Costs: Data regarding the direct costs and revenues associated with different drivers and agents will be collected with the aim to understand production systems and driver/agent group characteristics in economic terms. Here we employ a bottom-up approach to gather economic and other costs and benefits from the perspective of the deforestation agents, i.e. the relevant market prices of products and services will be calculated and subsistence activities may be estimated based on clearly communicated and appropriate default assumptions. The opportunity costs assessment follows guidance by World Bank and UNIQUE forestry and land use opportunity costs assessment manual and tools (see World Bank 2011 for introduction). Key parameters and assumptions for opportunity costs assessment, e.g. discount rate, value of household labor, etc. will be transparently documented and results graphically illustrated.

Assess impact of planned infrastructure developments: Infrastructure in the context of this study is understood as the construction of roads in the Interior. Road construction has a relatively limited direct impact on forests, however it indirectly leads to significant increases in deforestation by interacting with other land use sectors, especially mining, agriculture and forestry. Therefore, although the opportunity cost assessment will focus on agriculture, mining and

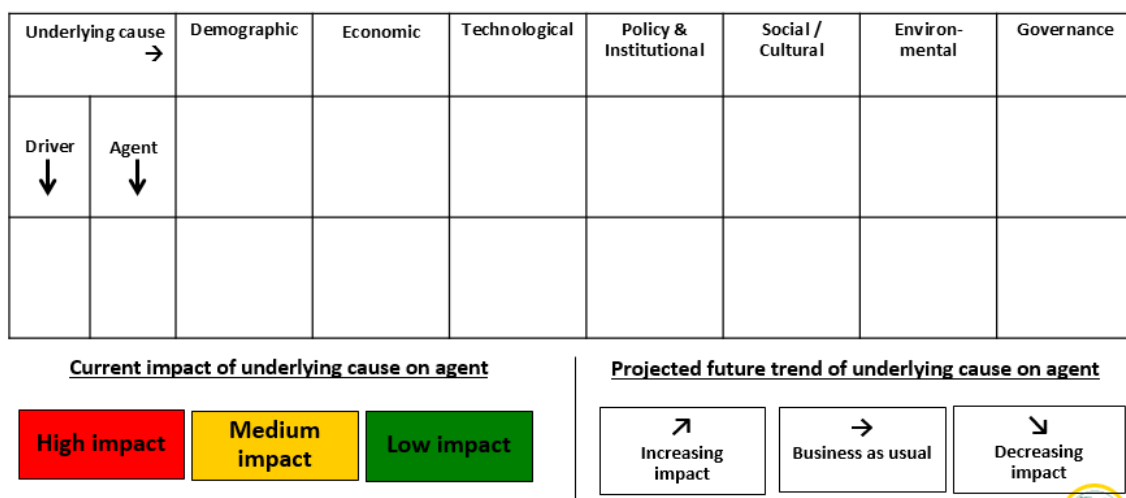
forestry, the (indirect) impacts of infrastructure will be taken into account in the economic analysis.

Assess non-carbon and non-economic benefits associated with the forest and driver: Land users and local communities value forests for much more than their GHG sequestration potential, or benefits that are difficult to assess in quantitative terms, referred to as “non-carbon benefits”. Hence, the purpose of this step is to supplement the economic and carbon benefits analysis above. In this step, we will gather additional data regarding the local benefits of forests that is not easily captured in the above opportunity cost assessment. Qualitative data will be the main information source for this step, except where existing studies can be sourced. The information gathered here may serve to preliminarily inform the SESA, but the SESA will need to go into much more detail regarding the social and environmental impacts associated with the different strategy options.

Described deforestation and forest degradation agents: The qualitative assessment of agents will focus on their production systems, motivation, and means of operation, emphasizing the inter-linkage between the proximate drivers, agents and underlying causes. This step may also be combined with the above co-benefits assessment, in so far that information regarding the social and environmental impacts of deforestation and forest degradation and the livelihood and other benefits of forests may be gathered.

Assess underlying causes and future trends: Information regarding underlying causes will be gathered, analyzed and triangulated throughout the study, including in the above steps. As much information regarding underlying causes is anecdotal based on past experience, expert interviews with key stakeholders (e.g. deforestation/degradation agents, local elites, people doing shifting cultivation, other local people, elected officials, decentralized structures and individual deforestation/ forest degradation agents such as private sector actors or small-scale subsistence farmers) will be carried out. This will be combined with local-level assessments based on focus groups carried out during field work with the aim of assessing underlying causes and their relationship to the proximate drivers and agents. Subsequent data analysis will be structured according to the following analytical framework, where the current and future impacts of different underlying causes/factors will be linked to the specific drivers and agents:

Figure 5 Analytical framework for underlying causes assessment



In terms of **process**, intermediary deliverables will allow for stakeholder and client feedback prior to delivery of the final report. Three sector concept notes for agriculture, forestry and mining will be prepared. These will serve as the basis for a series of technical discussions to be conducted at the end of October/beginning of November. SBB will invite further stakeholders to provide feedback on the concept notes and participate in these technical discussions, as appropriate. Further, ad hoc technical working groups may be formed to provide feedback on specific issues requiring further attention. See Chapter 4 for more details on the work plan and proposed activities.

3.4 Spatial analysis (Task 3)

Objective:

The triple objective of Task 3 is: 1) to build the capacity of SBB's FCMU, thereby allowing for continuity and ownership by allowing SBB as an institution to continue such spatial analyses; and 2) to provide inputs to inform the other Tasks in this assignment; and 3) produce high quality spatial products, which are to be included in the final report.

Inception mission summary:

During the inception mission, the existing images and classifications of forest and land use types were reviewed. The SBB work carried out in this context is described in section 5.1.3. Existing national forest type and land use classification were analyzed and compared against the classification specified in the R-PP and other available information. This included public domain and national datasets (e.g. SBB produced deforestation maps for the periods 2000-2009, approximately 30 000 ha; 2009-2013, ca 40,000 ha; 2013-2014, ca 15 000 ha). The classification methodology was analyzed, including image classification level identification, such as forest density classification such as open, medium and dense forest, and establishment of the standard classification criteria, based on Suriname's readiness process and analyses already in-hand. That classification is not according the standard forest density classification but it was agreed to continue with only forest and non-forest maps, considering time and quality of raw data (landsat) available to include the detailed forest classification. The limitation of these maps focus only on deforestation not degradation, therefore it was agreed to find another data source to address the degradation such as timber production data from the concession areas. It was suggested to disaggregate the analysis according to functional classes (e.g., production, protected areas, protection, temporarily no designation), which can be useful for correlating the subsequent analysis of REDD+ strategy options. The extent to which this can be done, however, depends on the information available.

Further, the World Resources Institute (WRI) dataset produced by Hansen et al. (2013) gives information on tree cover 2000-14 as well as annual forest loss and forest gain in 2000-2012. It is a global dataset based on Landsat and has 30m resolution providing pixel based information. The critical issue to answer here is in correlation to existing spatial information: a) which forest definition is used when deforestation is assessed; b) accuracy of the classification data; c) compare the results for deforestation (if possible, degradation) with the image material identified in step 1.

As a priority first sub-task, a **land use cover change analysis** will be carried out to assess the impact of the direct drivers. The result of this analysis is a land use change matrix that narrates historical area changes over time, which helps the validation of the most important land uses identified as causing deforestation and forest degradation in Suriname and provide a key output for Task 2. To the extent possible, the spatial analysis will be linked to forest governance, gender, land tenure, economic, social and environmental factors including safeguards and provide the key input for the analysis in Task 2. It will be ensured that data and analysis can be integrated into Suriname's NFMS and that it represents a spatial explicit analysis, disaggregated by sub-region and forest type, and including quantification of emission / removals.

Next steps- Implementation of the methodology through coaching and supervision:

Although UNIQUE has the in-house capacity to carry out this step, collaboration will be sought with the staff of the SBB Forest Cover Monitoring Unit and GIS Unit, and possibly additional technical staff from who were previously involved in activities linked to creating a Land Monitoring System. Our approach to providing the requested services combines national expertise with state of the art knowledge at the international level. Such collaboration would allow for verification of results while also strengthening national capacities. Thus, our MRV and spatial experts will supervise and guide the national experts to support the spatial analysis tasks required for this assignment. This is in the best interest of all involved, as effective participation fosters ownership and helps to ensure a successful implementation of the program. Additionally, this will ensure that we will build upon existing knowledge and identify relevant capacity gaps. This alignment will enable local beneficiaries to participate in consultations and capacity building in an organized and concerted way. Therefore the strategy will plan for building capacity within the country through "learning by doing" and active partnerships with implementing organizations/partners and government agencies. The coaching and supervision approach will be applied through weekly Skype calls and a 10-day training mission in October. UNIQUE will be responsible for delivery of all spatial products in the final report.

Based on the findings of the first mission, a comprehensive training workshop was developed to support the FCMU to carry out the necessary spatial analysis for Task 3. The general requirements of the training package has been agreed through an interactive and on-going process with the SBB. The following technical training aspects with its background and method:

- Training in how to reduce cloud coverage (e.g. Greenest pixel, Hansen/WRI data, google earth) which include using Greenest pixel images and visually verify the land cover in cloud areas from FCMU maps. Analyze the consistency between Hansen data and FCMU maps. Based on the results of Hansen data and Greenest pixel fill/replace the clouds to the land cover value from Hansen.
- Land use classification for deforested areas – FCMU maps has class of deforested areas which do not indicate the end land use/conversion. FCMU has detailed land use classification for only year 2009. It was agreed to do the same analysis for map of 2013 and 2015 to see the contribution of different drivers in deforestation. Follow up will be ensured through weekly calls and finalized during the second mission.
- Calculating deforestation rates- Since existing FCMU maps have considerable cloud coverage which will be replaced with other data source as explained in point above. The

deforestation rate and forest cover will change (not drastically based on the preliminary analysis).

- Reporting on statistical information- the information for land cover and change is available for several years, which will support analysis of the extent and trends of deforestation. This supports understanding the cause and relation in different land uses in deforested areas.
- Field trip planning (Preparation, indicators or criteria, processing) (optional)
- Data sharing standards (formats/ meta data/namings) – which included following standards naming conventions in GIS data files e.g. mentioning year, data source, projection etc. Best file formats such as raster and vector to share with other stakeholder. Use of Postgres DB over internet or intranet with different access type (view only or editing rights).
- Update infrastructure layer using QGIS and postgres DB (Topological error) – Infrastructure layer is basically roads which were mapped based on visual interpretation on land satellite images of 2014 and around. It was agreed to update the roads layer using secondary source such as high resolution imagery such as SPOT, Bing, Google maps (where ever available) etc. In addition to imagery sources some GPS tracked data is available from the GIS department in SBB, which will be also used as reference.
- Possibilities with WMS (additional) – to explore possibility of efficient way of sharing forest cover maps (raster) using web mapping service (WMS).
- Download and process greenest pixel data (with a script)- Greenest pixel is basically using landsat data available for long period. The data can be processed and downloaded using google earth engine. The idea is to use all landsat images available for the best land cover mapping time, and prepare the cloud free mosaic. The cloud free mosaic can be prepared using different methods such as latest cloud free values or highest NDVI (vegetation index) irrespective of the clouds coverage. Consultant will write a script along with a short manual on how to use the script. Hands on trial will be covered in the second mission.
- Regarding deforestation modelling:
 - Demonstration of future deforestation models using different software's (free and proprietary). The purpose of this task is to model the potential deforestation maps and predict the future deforestation hotspots. Consultant proposes to use the proprietary Terrset Land change modeler (LCM) which comes with easy to operate user interface. Model uses two time series maps (e.g. year 2000 and 2009) and predicts the changes over next 20 years (prediction years are flexible to change). Model allows to consider the variables driving the deforestation such as slope, elevation, stream network, distance to roads, settlement etc. Each land cover/use transition is modeled separately with influencing variables mentioned above. The second proposed free/open source land change model is using RandomForest tool in R-Script, which also gives potential land change maps based on historic deforestation in two time maps. The modeled deforestation maps based on 2000-2009 will be validated with map of 2013, 2014 and 2015 to check the validity of the model. There will be several trials to get the best models using different variables. Best model will be used in the final report.

- Compare the results of different models and select the best for project –Each model/software works slightly different and gives different results. The results will be compared based on the validity and accuracy of predicted maps and used in final analysis.
- Hands on training on data preparation and using in the selected model- during the second mission team received training on using the models which includes data preparation for model, analysis of different drivers and influencing variables etc. Consultant will build capacity of FCMU team to replicate the whole modeling exercise independently. Screenshots based operational manual can be prepared and delivered to team.

After the training mission, SBB staff will continue to receive technical support in spatial analysis, modeling usage part and interpretation of results through weekly skype calls. As the main deliverable of this Task, a detailed report will be co-authored which will outline the technical results, the methodological approach including identified shortcomings, uncertainties and risks, as well as the link and way forward with regards to the NFMS and the REDD+ process as a whole. The jointly prepared training curriculum, materials and tutorials as well as the workshop documentation will be annexed to this report.

3.5 Community perceptions and vision for forest (Task 4)

Objective:

The objective of task 4 is to support the drivers of deforestation and forest degradation assessment through gathering an understanding of the local communities' perceptions on drivers and barriers, and their vision for the forests. Task 4 seeks to obtain community perceptions on (1) identification of drivers (causes) of deforestation and forest degradation, and (2) identification of challenges, barriers and improvement options for forest management, conservation and enhancement of forest stocks. The aim of Task 4 is to sufficiently include community perceptions in the analysis of DDFDB+ in Suriname to support the inclusiveness of the national REDD+ process.

Keeping in mind the ultimate objective of informing the national REDD+ process with information on the abovementioned drivers and barriers, it is important to note that these terms need to be translated into the local languages in a way that respects local cultures and values. The questions need to be framed in a way that considers local knowledge and is fully aligned with the PMU engagement process. Further, it is also important to note the capacity of the RAC to ensure that Task 4 is successful in collecting the necessary information while also achieving capacity building. It is important to have realistic expectations concerning this group of REDD+ Assistants, all of whom were hired very recently and some of whom have not yet signed contracts with PMU.

Research questions⁸

Task 4 will provide information to be further valorized by the other Tasks in the DDFDB+ study. Specifically, Task 4 will collect information regarding specific land use sectors (mining, agriculture, energy, infrastructure, forestry, etc.) that will feed into Task 2. Further, Task 4 will provide information regarding the underlying causes of deforestation and forest degradation, as well as information regarding the barriers to the “+” activities of REDD+.

To the extent possible, Task 4 will also provide spatially explicit information that can inform and improve Task 3. The main topics to be assessed are the following:

How communities see the deforestation/forest degradation/forest management problem (how it impacts/would impact them) and its causes,

How they see their future and what they want to do with the forest (envisaged future) and how they would like to reach this future vision (solutions).

Some of the relevant overarching questions to be noted are:

What do different communities / community members see as drivers of deforestation and forest degradation? What do they see as barriers to forest conservation, sustainable forest management and reforestation?

Noting that this is highly context dependent, how would people rank the drivers - e.g. in their opinion, is mining worse than logging? Are mining activities/other drivers experienced as threat, opportunity or both? What do they perceive as the main drivers/barriers?

Future visions linked to drivers - are the lifestyles/jobs that people desire for themselves and their children compatible with a continued HFLD situation, or would it cause deforestation/ degradation?

Context

Suriname has a multi-ethnic, multi-cultural population. Local communities inhabiting the forested Interior represent six Maroon and four Indigenous tribes dispersed throughout. The country displays geographically defined disparities (Goede, 2014) with differences in socio-economic, cultural and ecological characteristics evident between the urban coastal, rural coastal and rural Interior populations. This major historical divide existing between the coastal region and the Interior influences the REDD+ process and thus requires particular attention.

From the onset of the REDD+ program in Suriname, criticism was received regarding local community engagement in the REDD+ discourse. Given the critical nature of this Task in the context of REDD+, the Task will be carried out through utmost adherence to principles of transparency. This serves as an example of the conventional approach taken towards the involvement of local communities in initiatives affecting development of their traditionally held lands. Through the

⁸ It is important to note that this assignment is a consultancy and not an academic research project. Therefore, the term “research questions” should be not interpreted in the later sense.

documentation of local communities' perceptions, the aim is to obtain a greater understanding of their values, needs, and interactions with their environment as these relate to the REDD+ eligible activities. This record keeping can serve as an important tool for cross cultural communication and set the conditions of participatory processes with the tribal communities to implement a national REDD+ strategy that incorporates the role, norms and values of those residing in the forested interior and depend on the natural resources for their sustenance and livelihoods. This analysis can serve both tribal community and government to arrive at a better understanding in communicating with members of the community and to understand the potential impact of major development decisions taken at the national level, which can lead to choices based on transparency and information.

Overall approach

When gathering *perceptions*, the idea of *world visions* becomes relevant: ' The root of the difference between the worldviews is that they generally subscribe to opposite approaches to knowledge, connectedness and science. Indigenous cultures focus on a holistic understanding of the whole that emerged from the millennium of their existence and experiences. Traditional Western worldviews tend to be more concerned with science and concentrates on compartmentalized knowledge and then focuses on understanding the bigger, related picture.⁹

Since drivers of DFD can greatly vary at the local level, capturing local communities' perspectives on drivers and barriers is crucial towards obtaining a comprehensive overview of the local complexities. It is important to note that given the diversity of the communities encountered in the Interior, it is expected that the documented perceptions will probably also reflect that diversity. Our approach will combine quantitative and qualitative data collection methods for utilizing local perspectives to guide decision-making processes at the macro-level (i.e. bottom-up approach).

Information for Task 4 will be obtained in a variety of ways, including the following primary and secondary data collection methods: bilateral and group consultations with primary stakeholders, desk review of grey and peer reviewed literature, community surveys and participatory scenario development. In order to: (1) reduce on travel costs, (2) limit the time input by participants of the community survey, (3) avoid stakeholder consultation fatigue, and (4) ensure diverse regions, cultures and voices are reflected within the assignment, the proposed methodology builds on the existing structure of the REDD+ Assistants Collective (RAC). Therefore, close collaboration, support and facilitation of the PMU REDD+ office are key conditions to build, empower and employ the RAC and to carry this assignment through in a timely manner.

The approach has been a collaborative design between the SBB, NIMOS and the consultant team. A number of meetings have already taken place to agree on the approach for this Task. In a first meeting on August 23, the consultants discussed the planned activities with the PMU REDD+ office. During this meeting, the importance of harmonized work plans related to community consultation, coordination and support to progress with the scheduled activities was emphasized. A follow-up meeting with the PMU specific to the cooperation for Task 4 was held

⁹ Hart. M. A. (2006) *brief reflections on sharing circles and indigenous worldviews and empowerment, Indigenous Social Work around the World: Towards culturally relevant education and practice* .

on September 9th. The first short meeting regarding the planning of the inception meeting and training of the RAC took place on September 13th with the PMU REDD+ Communication officer. Further face-to-face meetings were constrained but regular e-mail communication replaced these meetings.

Document review

At the beginning of September, the REDD+ PMU provided the reports describing relevant consultations already conducted with local communities in the context of REDD+ which were held by the PMU REDD+ office and the RAC. Further existing documentation, ranging from methodology, cases of lessons learned and community reports have been reviewed. The review has shown that isolation has aided Suriname's ecosystems, natural resources and local culture of the indigenous peoples in maintaining their pristine characteristics. Additionally, the fact that communities living in isolated areas are solely dependent on the ecosystems services provided (provisioning, cultural, income generation, recreation). Subsequently, any interference at a greater scale may seriously impact on local people's livelihoods. Regarding the issue of deforestation and forest degradation, the review has also revealed that a degraded forest ecosystem can be considered a significant environmental cost of small-scale gold mining alongside a plethora of social costs. Gathering local communities' perceptions on drivers of forest degradation and barriers to REDD+ is valuable because expectations concerning people's responses to policy changes are more likely to be accurate when they make allowances for how people themselves view their possibilities in society.

Stakeholder consultations held to date¹⁰

Since the geographical area of interest for this study applies to more than 80% of the country, quite a few organizations exist that are actively involved with local communities and offered valuable information significant to the assignment. The information showed noteworthy differences in forest/driver related perceptions and priorities in different regions of the country (including Paramaribo), and between different Indigenous peoples and Maroon tribes. In order to build upon this knowledge, other national stakeholders such as governmental institutions, other private sector and NGO/CSO representatives, Indigenous and Maroon community organizations, were interviewed prior to designing the survey. The results of these consultations strongly emphasized on the importance of the diversity of Indigenous and Maroon communities, both internally as well as between Maroon and Indigenous peoples. This will result in a diverse range of visions and perceptions of the forest, the approach to deforestation and forest degradation and its drivers and a variety of success factors or barriers to REDD+ and future visions.

An item that came up as a main topic in the stakeholders' consultation sessions during the inception, which is of influence on the attitude towards the forest and their livelihoods, was the issue of the significant social divide occurring between the coastal region and the interior.

¹⁰ Please see spreadsheet of stakeholder consultations for more detailed information.

In areas inflicted by gold mining, the community does not consist solely of Indigenous or Maroon tribes but is under the influence of immigration, especially Brazilians.

Government of Suriname's capacity to close the equity gap. The disadvantaged position on both social as well as economic grounds will play an important role in embracing or rejecting REDD+ and embracing those activities that are defined as drivers of deforestation. The fast growing Maroon community (Census 8, Suriname General Bureau of Statistics-ABS) can lead to more economic/social challenges.

Concerns were raised regarding Suriname's current economic situation, and the resulting impacts on social and education levels in relation to management and implementation of programs, including REDD+.

Survey design

A draft questionnaire for data collection has been designed to gather qualitative and quantitative information to identify what people in different parts of the country perceive as threats and opportunities linked to forest and land use. Further, the survey aims to gather perceptions related to the role of forests in Suriname in sustainable development. In this qualitative section of the survey we will focus on participatory development of future scenarios, working with focus groups to determine their vision of the forest. This future visioning information is valuable for the National Strategy process. Photo documentation will help to mitigate the problem related to REDD+ Assistants simply filling out the survey themselves.

The draft survey was discussed with the engagement specialist consultant of NIMOS REDD+ PMU to streamline with the engagement strategy proposed. The final draft survey will be tested on three RAC communities. This serves several purposes: (1) to incorporate feedback and adjust the survey where necessary, (2) to allow for the RAC to familiarize themselves with the survey which is essential for implementation in the field, (3) to build capacity of the RAC with regards to survey conduct using ODK software. Parts of the survey are adapted from survey forms utilized in Ethno Ecological Studies conducted in Indigenous Communities (Heemskerk, 2007; Heemskerk and Delvoye, 2007), during which a sustainable livelihoods approach was utilized. The sustainable livelihoods approach is useful for enhanced understanding of people's access to resources, skills and knowledge which offers a basis for determining constraints to livelihood development, which are located either at the local level or in the broader economic and policy environment.

Three pilot communities have been selected based on the following criteria:

RAC home base/ location

Land use, drivers of deforestation (representing the diversity of drivers)

Tribe representation

Geographic area (diversity)

The criteria of the pilot communities have been discussed and agreed on together with the engagements specialist consultant of NIMOS. The final selection will be based on the information and performance of the REDD+ Assistants during the training in October.

Survey questions

The following questions will inform the survey. Please note that the survey questions will be finalized based on joint development with RAC and three pilot tests in communities.

What are community members' opinions about the biological, ecological, socio-cultural and economic value of the forest?

How do they depend on the forest?

How does deforestation affect their lives/ future?

How does forest degradation affect their lives/future?

What do they see as sources of deforestation and forest degradation?

What are their customary roles to address this and/or are these affected?

Do they see a solution or better opportunity to keep the forest?

What is the value of the forest to your community (economic, social and ecological)?

How is your livelihood dependent on the forest? What challenges do you have using the forest in providing for your family? How do you see this in the future?

What are the customary roles for forest management? What are the challenges in holding on to these customary roles? How do you see this in the future?

Which are the sources for forest degradation? And deforestation? Which of these sources are the most important? And why?

What challenges do you encounter in sustainable forest management? How would you like to overcome these (economic, social, legal)? How do you see forest management in the future? What improvement can be made?

How do you see your livelihood with the forest in the future? What prerequisites are necessary for a good livelihood? How can you improve your livelihood?

What potential does REDD+ have for you in: forest management, livelihood?

What experience have you had with community forests and is this perceived as a viable, equitable and sustainable option for REDD+?

Who owns the forests? Does this have an impact on how forests are managed?

Please note that the focus on the term “drivers” of deforestation will be further evaluated during the inception workshop to consider the following:

1. The many conflicts regarding logging and mining concessions and the positions of SBB and other different entities. Questions with a strong technical focus regarding deforestation and forest degradation will make it difficult to support engagement and participation and can lead to feeding the conflict instead.

2. The worldview of forest dependent people is different as they have a holistic approach to man and environment. We aim to be culturally appropriate and see to it that the worldview of the communities can relate to the questions of the survey. Although we address the research questions in the participatory scenario exercise we will add some specific questions to the survey to discuss with the RAC during the training.¹¹

Participatory scenario development

Methodology

-Discussions with 5 focus groups: 1.women, 2.elderly, 3.youth, 4.leaders, 5.livelihood/resource user group (hunters/fishermen/miners/loggers/guide)

-Groups of max. 4 persons Drivers assessment: drawing a risk map

¹¹ Reference: ' The root of the difference between the worldviews is that they generally subscribe to opposite approaches to knowledge, connectedness and science. Cited from: John Bodlye 2012. *Cultural Anthropology: Tribes, States, and the Global System*

First exercise is draw a map to enumerate the risks in the community

-Let's focus on the interactions that are happening at present day between humans and the forest.

-Draw these interactions out on a map of your village.

-Which of these interactions is considered a risk to the forest's health? Please indicate on the map by circling it out

-Rate these interactions as follows:

If it is considered a small risk: place a green dot at the location

If it is considered a medium risk: place an orange dot at the location

If it is considered a large risk: place a red dot at the location

-Carry out the same for a map of the future



Exercise 1: (Present: yes there are drivers or no there are no drivers)

Let's draw a picture of the present, utilizing the visuals at hand. Incorporate these visuals in your view of today's reality.

-Please explain what you have 'drawn'; tell me your story



- Describe the forest and/or the community
- Are there humans present in this picture? Who are these people? Are they from the community, or from outside the community. Are they part of an institute/organization or individuals? Are these public or private entities? If not present tell us why
- Are there humans carrying out actions? What are these actions/activities that they are involved in?
- Are there actions with benefits? What are the benefits created by these actions? Who benefits from these actions->the forest in providing for your family? the community as a whole or only a part of it; the government, the private sector, the environment, the country Suriname, or others?
- Are there negative consequences generated by these actions? What are the negative consequences created as a result of these actions? Who is negatively impacted by these actions->the community as a whole or only part of the community; the government, the private sector, the environment, the country Suriname, or others?

Exercise 2: (Future: yes there are drivers or no there are no drivers or yes there are expected drivers)

Let's draw a picture of the future, utilizing the visuals at hand. Incorporate these visuals in your vision of the future; let's say 5 years from now.



- Please explain what you have 'drawn'; tell me your story of how you see the future
- Describe the forest and/or the community
- Are there humans carrying out actions? What are these actions/activities that they are involved in? Have these actions made the forest become larger, has the forest grown in size? Or have

these actions made the forest become smaller? Decrease in size? Which of these actions have contributed the most to forest loss? Which of these actions could contribute to forest growth?

-Is the forest of the future a healthy forest or a forest that is in poor condition? Why is that?

-In your own words and utilizing the visuals, what constitutes a healthy forest? And what constitutes a poor forest?

-Are there any benefits generated by these actions? What are the advantages that are enjoyed as a result of these actions? Who is enjoying the benefits resulting from these actions->the community as a whole or only a part of it; the government, the private sector, the environment, the country Suriname, or others?

-Are there negative consequences generated by these actions? What are the negative effects created as a result of these actions? Who is negatively affected by these actions->the community as a whole or only part of the community; the government, the private sector, the environment, the country Suriname, or others?

Exercise 3: *utilizing the visuals...please complete the following sentences*

The path of **logging** will lead to:

- Better conservation options
- Better education options
- A better community
- A better Suriname
- Income/employment
- A healthy forest
- Other, _____

The path of **mining** will lead to:

- Better conservation options
- Better education options
- A better community
- A better Suriname
- Income/employment
- A healthy forest
- Other, _____

The path of **REDD+** will lead to:

- Better conservation options
- Better education options
- A better community
- A better Suriname
- Income/employment
-

A healthy forest
 Other, _____

The path of **NTFPs** will lead to:

- Better conservation options
- Better education options
- A better community
- A better Suriname
- Income/employment
- A healthy forest
- Other, _____

The path of **tourism** will lead to:

- Better conservation options
- Better education options
- A better community
- A better Suriname
- Income/employment
- A healthy forest
- Other, _____

The path of **Pet Trade** will lead to:

- Better conservation options
- Better education options
- A better community
- A better Suriname
- Income/employment
- A healthy forest
- Other, _____

The path of **agriculture** will lead to:

- Better conservation options
- Better education options
- A better community
- A better Suriname
- Income/employment
- A healthy forest

Other, _____

The path of **business as usual** will lead to:

- Better conservation options
- Better education options
- A better community
- A better Suriname
- Income/employment
- A healthy forest
- Other, _____

The path of **conservation of cultural values** will lead to:

- Better conservation options
- Better education options
- A better community
- A better Suriname
- Income/employment
- A healthy forest
- Other, _____

Exercise 4: *considering the pathways discussed in exercise 3, please prioritize a top 3 based on their importance to you*

1. _____
2. _____
3. _____

Task 4 external review

The revised survey is reviewed again by the engagement specialist Ms. Gwendolyn Smith and is to be validated by the RAC and reviewed by the social scientist Ms. Marieke Heemskerk before the start with the pilot communities.

RAC Training

The inception meeting and training of REDD+ Assistants for survey execution will be held in the weekend of 7-9 October, providing that proceedings with PMU REDD+ office will take place. This training is important as REDD+ Assistants need to integrate the survey into their core activities and other assignments which allows significant savings on the costs.

Risks, Challenges and mitigation strategies

Capacity of the RAC

-The ability of the RAC to effectively use the phablets to execute the survey is uncertain. The information in writing regarding the phablet training has been requested but this is still forthcoming. The results of a pilot test to collect information, has not yet been received. Therefore, we propose organizing a 3-day workshop to further train the RAC.

-Based on the information contained in the RAC contract, the role of the RAC focuses on supporting NIMOS and other partners in REDD+ activities involving the communities. Taking this into consideration, it is important that the data collected will be validated with the representatives of the interviewed communities. This will empower the goal of transparency and participation which will contribute to a strong basis for the development of a national REDD+ strategy and SESA. To ensure the REDD+ Assistants do not simply fill in the survey themselves, photo documentation of the Assistants carrying out the survey in their communities will be requested.

Cooperation

It is necessary that all supporting parties involved, regarding the study of community perceptions, take ownership of this study. This will have a positive influence on the progress and cooperation to proceed with the necessary activities. Therefore, we will continue with open and transparent communication.

Figure 6: Detailed workplan for Task 4

Objective	Activity	When (tentative dates)	Where	Who
1. Inception meeting and training of REDD+ assistants for survey execution	1.1 Day 1: share information with the participants regarding DDFDB+ study (scope, objectives etc.) and purpose of RAC training. Introduction to survey conduct and participatory scenario development 1.2 Day 2: training on survey conduct, including ODK application 1.3 Day 3: training on scenario development implementation (use of visuals and guiding questions to establish storylines). If time allows, continue with ODK	7 - 9 October	Paramaribo	National consultants: facilitation RAC: participants of the training Client (SBB and PMU): observers Logistical support: PMU
2. Visit pilot communities to test survey in order to allow for feedback collection and possibly survey modification	2.1 Pilot activity: 4 communities (2 Indigenous and 2 Maroon settlements)	Pokigron and Witagron: 20-22 October Apetina: 28-30 October Kwamala: 2-4 November	Indigenous communities: Kwamalasamutu and Apetina Maroon tribes: Pokigron and Witagron	RAC: execution survey and scenario development National consultants: guidance/support RAC Client (SBB and PMU): observers Logistical support: PMU
3. Second round stakeholder consultations for achieving broader support study results	3.1 Implement stakeholder consultations/interviews	2nd week of October (period 12-18 October)	Coastal region, Paramaribo	National consultants: conduct interview/consultation Primary stakeholders: those which were not consulted the first time around (during the inception meeting)
4. Support execution of community perception and vision for the forest survey	4.1 Execution of survey with timely collection and organization of data. Each RAC member will interview 5 key informants and execute scenario development with 5 focus groups	3rd week October- 2nd week November	All 12 communities where the RAC live: Apetina, Futunakaba, Pokigron, Nieuw Arora, Abenaston, Cottica Lawa, Witagron, Mooitaki, Uma Holli Taanga, Galibi, Pusugrunu, Kwamalasamutu	RAC: execution survey and scenario development National consultants: guidance/support RAC Logistical support: PMU ODK data sharing support: SBB
5. Survey results analysis and integration into drivers analysis	5.1 Review of collected data and commencement data processing	Starting from last week October	Paramaribo	National consultants together with survey expert for processing collected data
	5.2 Survey analysis and report preparation	Starting from first week November	Paramaribo	National consultants
	5.3 The final results will be presented in the stakeholder validation workshop	1st week December	Paramaribo	National consultants will organize the event venue, translation and f&B, and present task 4 outcome Community representatives: to validate the results of the study Participation is tentative, and depends on budget carry-over. Alternative option is to appoint CBOs located in Paramaribo to represent communities in the validation workshop in Paramaribo Unique team: presentation task 1-3 outcome PMU/SBB: logistical support

3.6 Reporting and stakeholder validation (Task 5)

Finally, the inputs from the four previous tasks will be combined to establish comprehensive report that links all four tasks in one final report. The final report will follow the draft outline provided below:

Proposed draft structure of the final report:

- 1) Executive summary
- 2) Introduction
- 3) Approach and methodology of the DDFDB+
- 4) Explaining Suriname's HFLD status
- 5) Suriname's spatial analysis of deforestation and forest degradation
 - a) Overview of historical deforestation patterns in Suriname (maps and quantitative information on forest losses and trends)
 - b) Sector specific analysis of deforestation and forest degradation by individual sector (infrastructure, agricultural, forestry, mining), including sector specific maps and quantitative data
- 6) Explanation of the proximate drivers, agents and underlying causes of deforestation and forest degradation
 - a) Mining sector
 - i) Agents in the sector leading to deforestation and forest degradation
 - ii) Opportunity costs assessment
 - iii) Co-benefit analysis
 - iv) Underlying causes of deforestation and forest degradation
 - b) Forestry sector
 - i) Agents in the sector leading to deforestation and forest degradation
 - ii) Opportunity costs assessment
 - iii) Co-benefit analysis
 - iv) Underlying causes of deforestation and forest degradation
 - c) Agricultural sector
 - i) Agents in the sector leading to deforestation and forest degradation
 - ii) Opportunity costs assessment
 - iii) Co-benefit analysis
 - iv) Underlying causes of deforestation and forest degradation
- 7) Projection of future deforestation risk
 - a) Scenario analysis and modeling of future deforestation by taking into consideration future
 - (1) Infrastructure investment in the Interior
 - (2) Hydrodams
 - (3) Agroindustry investments (e.g. palm oil)
 - (4) Large-scale mining
- 8) Community perceptions and vision of local communities
 - a) Survey design and methodology
 - b) Summary of the perceived key drivers of deforestation and forest degradation

- c) Summary of the local communities' vision for forests in future
 - d) Key conclusions and recommendation for the development of the REDD+ strategy, policies and measures and key areas for the SESA/SIS
- 9) Key barriers for REDD+ in Suriname
 - a) Summary and identification of the key barriers to REDD+ implementation in Suriname by synthesizing the key information generated in Task 1, 2, 3 and 4.
 - b) Identification of key issues relevant for the REDD+ strategy development, policies and measures
 - c) Discovered key limitations to measure, report and verify deforestation and forest degradation drivers and develop FRL/FREL (from Task 3) and directions for improvement
 - 10) Conclusions and strategic recommendations for REDD+ in Suriname including REDD+ strategy and PAMs, SESA/SIS, FREL/FRL and NFMS.
 - 11) References
 - 12) Annexes

The report structure envision to bring all four Tasks in a well-structured, logical and comprehensive report. The generated Task 1 information will be mainly integrated in the chapter 4 and 9. Task 2 and Task 3 information will be fully integrated in the chapter 4,5 and 6. The task 4 will be mainly presented in the chapter and the key information will be integrated in the chapter 9 and 10.

The chapters 9 and 10 will be the main will use the information from all four chapter and outline the key barriers for REDD+ in Suriname and outline strategic direction for the further development of REDD+ by taking into account the linkage to National REDD+ strategy development, SESA/SIS, FREL/FRL and NFMS and accessing REDD+ finance. After submission of the draft report it is expected that the client will provide comment for improvement that will be taken into consideration by the consultant team.

The key results will be presented to the national stakeholders during a one-day workshop. The key content will be closely coordinated with SBB. Feedback received will be integrated to improve the report. This one-day workshop should be combined with relevant processes running in parallel. Especially the national REDD+ strategy development should ideally have a stakeholder workshop planned to take place directly following the drivers workshop.

We estimate the number of participants at roughly fifty, including the REDD+ Assistants. NIMOS/SBB is expected to provide the participants list and be responsible for sending invitations in a timely manner. UNIQUE will support in organizing the venue and refreshments. However, this should ideally be combined with other relevant workshops to the extent possible.

4 WORK PLAN

Table 2: Deliverables schedule

Activities / Deliverable	When	Responsible
Consolidated feedback provided on inception report	– October 10	▪ SBB/NIMOS
Task 3 Training Mission	▪ October 12-21 (to be confirmed with SBB)	▪ UNIQUE/SBB
REDD+ Assistants Training Workshop for survey	▪ First week of October (3 days)	▪ UNIQUE/NIMOS
Survey execution in pilot communities	▪ Second and third week of October	▪ UNIQUE
Draft DDFDB+ Study report	▪ November 23	▪ UNIQUE
Feedback provided on draft report	▪ November 28	▪ SBB/NIMOS
Draft DDFDB+ report circulated amongst stakeholder workshop participants	▪ December 5	▪ UNIQUE/SBB
National stakeholder workshop to present DDFDB+ Study findings ¹²	▪ Week of December 5	▪ UNIQUE/SBB/NIMOS
Written comments to DDFDB+ Study report received from all relevant parties	▪ December 19	▪ SBB/NIMOS
Incorporate feedback received and finalize report	▪ December 31	▪ UNIQUE

¹² To the extent possible, this should be coordinated with the assignment for developing the national REDD+ strategy as well as the launching of SBB's geoportal.

5 RESULTS OF TASK 1

This chapter provides the results of Task 1, including an analysis of the current status of forests in Suriname. Further, this chapter provides explanations for why the country has maintained its HFLD status to shed light on the potential for this status to be maintained into the future. Finally, the chapter ends with an overview of the potential and barriers to the five eligible REDD+ activities in the context of Suriname. This provides the basic analysis which guides the rest of the work to be carried out for this assignment.

5.1 Overview of the state of Suriname's forests

Due to its vast forest areas which act as a carbon sink, Suriname is a carbon negative country. In Suriname's Meerjaren Ontwikkelingsprogramma (OP) 2012 – 2016, the protection of the natural environment, with focus on the safeguarding of carbon sinks, biodiversity, soils and water, has been identified as a key area of interest. The government aims to integrate this into the country's longer term development plans, where sustainability of the social, economic and natural environment is key. According to Suriname's Intended Nationally Determined Contribution (INDC)¹³, the country aims to maintain its high forest cover and low deforestation rate by practicing sustainable forestry management in an effort to promote multiple use of its forest resources while at the same time exploring options for the payment of forest climate services that its forest provide.

Suriname, located between Guiana in the west and French Guiana in the east, and bordering on the Atlantic Ocean in the north and Brazil in the south, lies just above the equator between 2° and 6° N and 54° and 58° W. The country has a typical tropical moist climate with a daily average temperature of 27.5 °C, and an annual range of only 3 °C. Mean annual rainfall varies between 1500 mm on the coast and 2500 mm in the higher areas in the central and southern parts of the country.

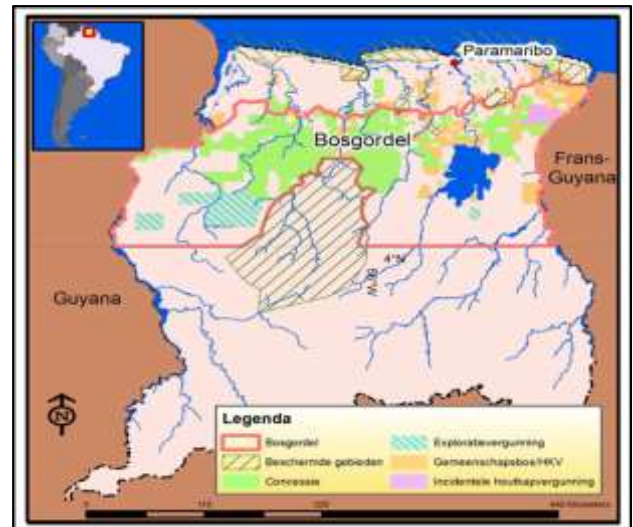
The country is divided into a mountainous region and a coastal zone. The mountainous region covers roughly 80% of the country, consists of pre-Cambrian rock and is part of the Guiana shield, the world's oldest rock formation. The highest point is Juliana-top at 1230 m above sea level. The coastal zone consists of the young coastal plain, the old coastal plain, and the Zanderij formation or cover landscape. The young and old coastal plains are almost flat or only elevated by a few meters, and generally have heavy textured and badly drained marine clay soils interspersed with sandy areas. The Zanderij formation tapers from about 100 km wide in the west to about 40 km wide in the east.



¹³ Republic of Suriname, Intended Nationally Determined Contribution under UNFCCC, 30 September 2015.

Forests in the young coastal plains consist of low swamp forests, including mangroves, covering about 3% of the land area. Tall swamp forest mainly occurs on the old coastal plains and covers about 2% of the country. Tall seasonal swamp forests may occur on poorly drained soils, low ridges and plateaus of the coastal plain, as well as along creeks and rivers in the Savanna Belt and the interior (Werkhoven, 1996).

The tall dryland forest of the interior is described as seasonal evergreen forests. These forests occur on the well-drained soils of the higher ridges in the interior, on the plateaus of the coastal plains, and on the loamy sands of the Savanna Belt (Lindeman, 1988). The exploitable Forest Belt (bosgordel), totally located above 4° N latitude, is defined as a 40 to 100 km wide forest zone, south of the Savanna Belt and north of the rugged hill country and the rapids.



The then declared Forest belt comprises some 2.5 M ha (National Forest Policy, 2005). This previous forest belt is widened with the designation of the area south of the belt to be issued for timber concession. SBB maintains roughly a borderline of the fourth latitude as land to be allocated for commercial timber production.

In the final draft version of the Strategic Forest Sector Action Plan (Peter van der Hout, 2007) the vegetation of Suriname is classified into three main types: hydrophytic, xerophytic and mesophytic. The areas of the forest types that occur within these broad vegetation types are presented in Table 3.

Table 3 Forest types by area

Forest vegetation	Area (ha)
Hydrophytic vegetation	
Mangrove forest	115.000
Swamp forest	725.000
Ridge forest	35.000
Marsh forest	470.000
Xerophytic vegetation	
Low savannah forest	18,000
High savannah forest	132.000
Mesophytic vegetation	
Lowland high forest	13.360.000
TOTAL	14.855.000

Source: LBB (1990) in Mitchell (1996)

Hydrophytic vegetation occurs in areas of either impeded drainage or in areas that are subject to regular flooding. These areas include:

- Mangrove forest which is found along the Atlantic coast and river levees and on the mud flats of the estuaries and river banks;
- Low swamp forest which varies from open woodland to single storied 10 to 15 m high forest in permanently inundated terrain;
- High swamp forest which is usually two storied and at least 20 m high;
- Marsh forests, generally two storied and 15 to 30 m high with irregular canopy, is found on periodically flooded areas in the flooded plain, river levees and creek valleys.
- Xerophytic vegetation occurs in areas where no water is available in the soil during part of the year either as a result of extreme drainage (i.e. on coarse sands) or shallow soils. This vegetation type includes:
 - Open and shrub savannahs, mainly found in the Zanderij formation;
 - Low savannah forest made up of thin-stemmed trees of 8 to 15 m high;
 - High savannah forest which reaches heights of 25 to 30 m.

Mesophytic vegetation mainly consists of high tropical lowland forest with a very diverse species mix. The forest often has several storeys, the canopy being between 30 and 40 m high, emergents can reach up to 50 m in height. The forests in the east and central part of the country are deemed richer than the forests in the west.

In addition to the natural forest resource, several plantations have been established. In the 1990's there were 7.000 ha of plantations of which the vast majority was planted with Caribbean Pine (*Pinus caribaea*). Most plantations have been neglected and no thinning has taken place since the 1980's. The condition and future of most plantations is uncertain (NFP, 2005).

5.1.1 Forest use in Suriname

Suriname is with 14.8 M ha of forest cover (93% of its total area) one of the most forested countries in the world. Of this, 4.5 M ha are designated as potential production forest. The most important part of this is issued as logging concessions (1.7 M ha) and community forest (0.6 M ha). Approximately 70% of the forest in Suriname is unaffected by forestry. Of this, 13% has a protected status; the remaining part is mostly situated south of 4° N latitude where no exploitation is allowed. It is expected that with the current rotation system the southern reserves can be left unexploited (see Table 2). Although 1.7 M ha is put forth as logging concessions, only about 1 M ha is currently actively managed. Of this, late 2015, 428,954 ha is FSC certified, including 32,754 ha of FSC Controlled Wood. (At the request of the company concerned, the FSC-CW certificate was not extended in 2016.) At present, there are no ongoing activities to expand the forest area under (FSC) certification.

Table 4: The status of forest lands

Suriname's land cover	Area (ha)	%
Overall land cover:	16.4 M ha	
Total forest area:	14.8 M ha (100%)	
of which state owned		97%
remaining private forest		3%
Of which excluded from timber production:	10.36 M ha (70%)	
forest located below 4° N latitude		57%
protected areas		13%
Potential production forest:	4.44 M ha (30%)	
Of which under licenses:		
Logging concessions	1.655.000 ha	37,3%
Exploration permits	325.000 ha	7,3%
Community forests (formerly HKV's) ¹⁴	612.000 ha	13,7%
Incidental Cutting Licenses (ICL)	52.000 ha	1,2%
ICL's for submarine logging	115.000 ha	2,6%

Source: SBB, 2014

5.1.2 Forest management in Suriname

Since the first attempts of the then colonial government around 1900 to regulate the forest sector in Suriname, it progressed with ups and downs. Until the 1940's the forest sector was weakly developed, but grew since 1947, after the re-establishment of the Forest Service (LBB) and the founding of Bruynzeel Wood Company (BSH). The present contribution of the forest-based industry to the gross domestic products is 1.7% and provides employment to 5,500 people (SBB PTT, 2015).

Forest management development in Suriname can be characterized by five periods, as briefly summarized in table 3. The transfer from one period to the next was mainly determined by initiatives of the forest management and research organizations, and not by a change of government policy or by the implementation of new strategies. Professional foresters in civil service were often the key innovators.

¹⁴ Community Forest Licenses ('Gemeenschapsbossen') were introduced in 2008 to replace the HKV.

Table 5: Review of the development of use and management of forests in Suriname

No	Period	Management concept	Main forestry activities
1	Before 1900	Selective unmanaged forest use	Collecting non-timber forest products; logging in private timber estates
2	1904 - 1947	Conversion of natural forests to uneven-aged stands; plantation of indigenous tree species	First 'Forest Service' establishing experimental plantations and testing timber harvesting; private logging along navigable rivers; boom in balata trade
3	1948 - 1977	Selective logging with management plans; monocyclic regeneration as open as well as strip planting	New 'Forest Service' starting forest inventories, opening up de Forest Belt and establishing pine plantations and natural regeneration experiments; extension of private logging into the Forestry Belt; establishment of the SBH integrated forest industry; mechanized timber harvesting
4	1978 - 1990	Sustainable forest management based on CELOS forest management research (CMS)	Forest management research; private logging in managed concessions; further progress in forestry training on operational, collage and academic level
5	1990 - present	The introduction of ecologically based forest management with RIL; polycyclic harvesting and natural regeneration (based on CMS); certified forest operations	Enforcement of the Forest Management Act; establishing SBB; formulation a National Forest Policy; introducing RIL and forest certification; international timber companies starting logging and wood processing

Source: Hendrison & De Graaf in M.J.A. Werger (2010).

In 1947, the Suriname Forest Service (Dienst 's Lands Bosbeheer, LBB) was set up to administer and the manage the nation's forests. Timber production was managed under a system of timber concessions. Special arrangements were made to grant timber cutting rights to tribal communities, allowing for the harvesting of wood and non-wood forest products in demarcated forest near to the communities' settlements, as well as shifting cultivation.

In the early years, LBB carried out forest inventories and established the necessary infrastructure (roads and bridges), the Forestry Belt was made accessible by 2,500 km of all-weather forest roads. Concessionaires had to pay a number of fees including royalties on the produced timber. Logs were marked and royalties had to be paid before the timber could be transported from the forest. A series of permanent forest guard stations was established and 500,000 ha was allocated to the state owned enterprise BSH. At the time LBB was regarded as one of the best forest services in tropical America.

The country's political course taken in 1980, its international isolation in 1982 and reduction of foreign investment resulted in an internal armed conflict from 1986, causing a temporary halt in logging, and the destruction of hinterland infrastructure and property. The internal conflict was formally ended in 1992. As a result of these events, the system of forest management had collapsed. By 1986, the issuing and renewing of concessions had stopped and remained so till the enactment of the 1992 Forest Management Act.

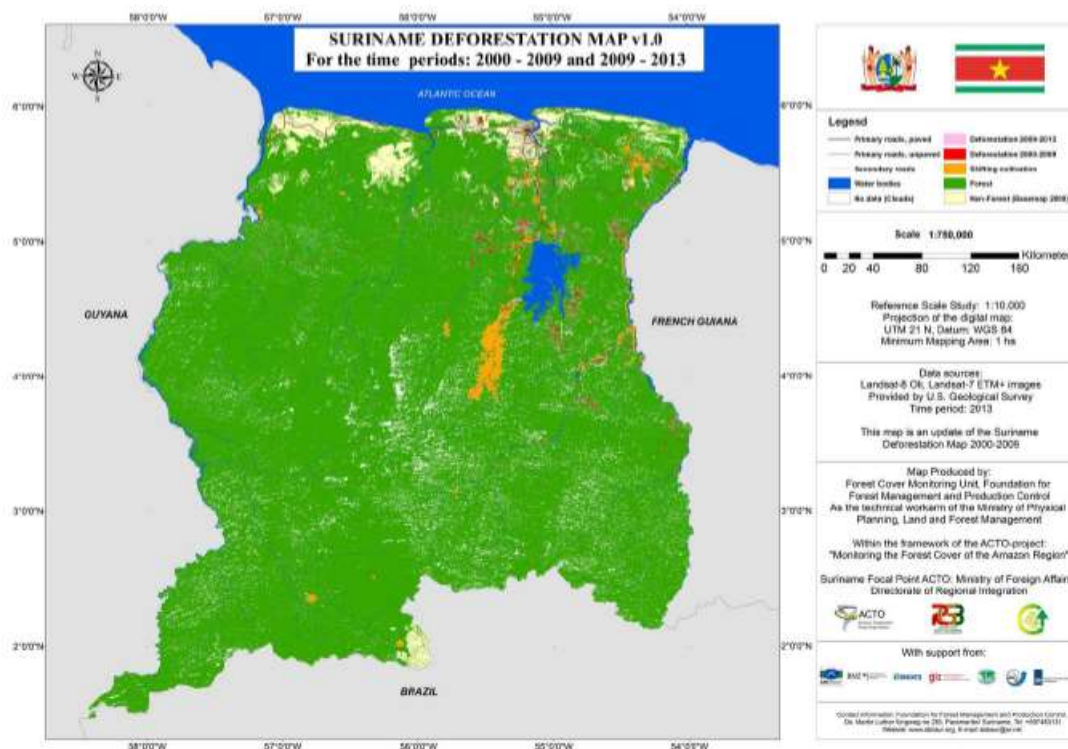
By 1993, the government of Suriname invited Asian investors to explore the possibilities for establishing large scale logging concessions in Suriname's interior. The proposed concessions drew both local and international criticism, urging for strict forest management. By 1995, LBB assumed that much of the domestic timber harvesting went unrecorded with a very low capture of the fees due. In 1996 it was therefore proposed to establish the Foundation for Forest Management and Production Control (Stichting voor Bosbeheer en Bostoezicht, SBB) to monitor and control concessions, which institution would be gradually extended to oversee all forest management (Van der Hout, 2007). SBB was formally established at August 22, 1998 by the Ministry of Natural Resources and is since 2005 under the Ministry of Physical Planning, Land- and Forest Management.

5.1.3 Summary of state of knowledge regarding drivers

This summary of existing knowledge aims to outline the major findings of the recently conducted studies related to deforestation drivers, agents and causes in Suriname. This provides the basis upon which to build for Tasks 2-4. For R-PP development, Suriname carried out a quick assessment of key drivers of deforestation and forest degradation, including the conditions that might trigger or accelerate this DFD process (ROS 2013). The R-PP provided an overview of the identified drivers of DFD, the institutional arrangements and existing legislation, conditions that might trigger or accelerate the DFD process, and 'gaps and constraints' to be addressed to stop DFD. The assessment took into account Government policies and development plans for the period 2012-2016. The key drivers identified were mining, logging, infrastructure, agriculture, energy and housing (see Annex 4 for overview of R-PP findings). Since this time, a number of highly valuable studies have been carried out to provide a more concise picture of deforestation and to explain in more detail the processes underlying the on-going forest loss and degradation.

The SBB's Forest Cover Monitoring Unit (FCMU) has been conducting technical spatial analysis of drivers (focusing mainly logging and gold mining) since 2012. Amongst the most important products produced by the FCMU are the 2000 forest cover base map, a 2009 deforestation map, and a map showing deforestation from 2009-2013. These maps include the following classes: forest, non-forest, clouds, hydrography, shifting cultivation and deforestation. The forest definition employed follows the UNFCCC definition applying the following thresholds: minimum surface: 1 ha, minimum tree crown cover: 30%, minimum tree height: 5 meters. It is important to note that shifting cultivation and secondary forest in shifting cultivation areas were reported under the forest class, but both remain separate classes, thereby allowing for further categorization, as appropriate (SBB 2015).

Figure 8: Suriname deforestation map



Source: SBB 2015.

Based on this analysis, SBB provides the following quantifications of deforestation:

Table 6: Annual deforestation in Suriname (2000-2013)

Period	Preliminary total deforestation	Preliminary annual deforestation	Deforestation rate (% of total forest cover)
2000-2009	30459 ha	3384 ha	0.02%
2009-2013	38367 ha	9591 ha	0.06%

Source: SBB, 2015.

Given the significant increase of gold mining (especially small and medium scale gold mining (SMGM) in the recent years which has expanded considerably into the forest, a number of studies have focused on better understanding the impacts and processes of gold mining- notably Rahm et al 2015 and Dezécache 2015. These studies often take a regional approach to their analysis, given the transboundary nature of this driver which is linked to the Greenstone Belt¹⁵, geographically spread across parts of Suriname, Guiana, French Guiana and the Brazilian state of Amapá. Specific to the case of Suriname, the results show that deforestation due to gold mining has doubled between 2008 and 2014 compared to the 2001-2008 period (Rahm et al. 2014). Further, the negative environmental and social (health) impacts of mining due to mercury pol-

¹⁵ The Greenstone Belt is a geological formation known for its large reserve of gold.

lution and water turbidity are relatively strong in Suriname as compared to neighboring countries due to the concentration of activities in the northeastern part of the country close to the border with French Guiana (ibid.) A case in point is that gold mining not only results in deforestation but also in pollution of water, turbidity in creeks and rivers, and in decrease in wild life, which influences the forest composition. Ultimately this can lead to the empty forest syndrome where forest composition has been severely declined.

An on-going PhD research project that aims to model future carbon emissions from deforestation and forest degradation in the Guiana Shield provides insights into potential explanatory factors underlying deforestation caused by gold mining. In terms of geographic location of future gold mining, distance to the Greenstone belt is the most important variable.¹⁶ In terms of mining intensity, the significant link between the price of gold and expansion of mining has been established.

5.2 Explaining Suriname's current HFLD status

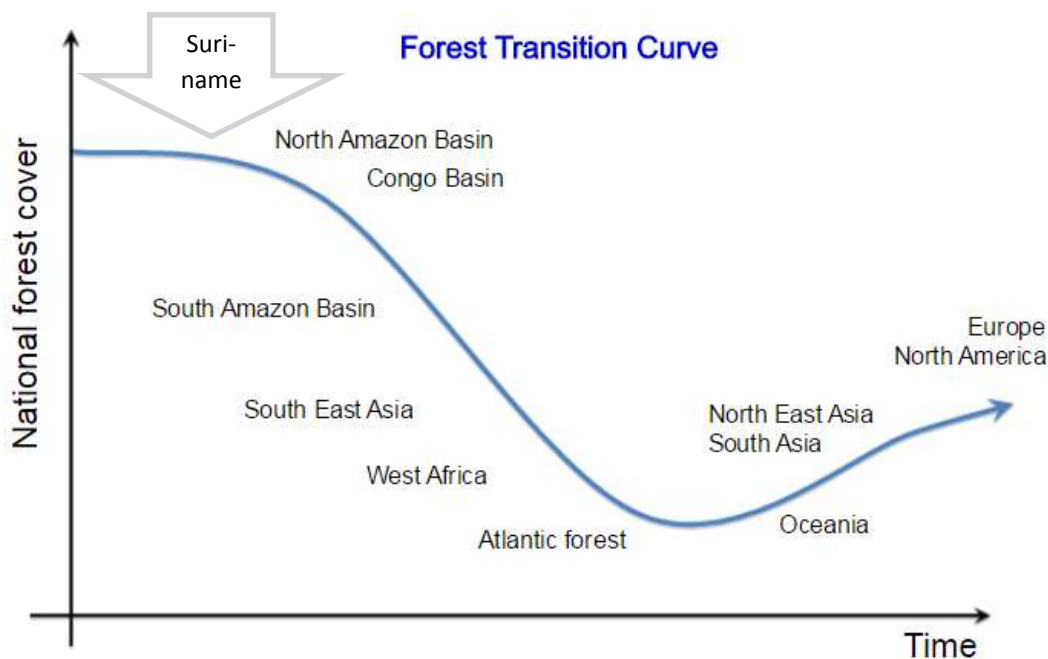
Designing and implementing effective REDD+ policies critically depends on a country or region's particular circumstances (Angelsen & Rudel 2013). Therefore, the forest transition theory is a useful lens through which the spectrum of possible REDD+ policies and strategies can be designed in a way that is adapted to a country's circumstances in a given point of time.

5.2.1 The forest transition theory

The forest transition theory refers to the empirical regularity that a country or geographic region over time moves through a series of stages reflecting the overall status of forests and the rate at which forest cover change is happening (Mather 1992). Initially, a country has a high and relatively stable portion of land under forest cover. Deforestation begins, then accelerates as forest cover continues shrinking ("frontier forests"). Then the deforestation rate tends to stabilize as forest cover is no longer as prominent. Finally, at some point there is an eventual reversal of the deforestation process as the country shifts towards reforestation (see Figure 9).

¹⁶ Preliminary results presented during a National Stakeholders meeting in Suriname. 2 November 2015.

Figure 9: The forest transition theory



Source: FCPF 2009 (based on Zarin 2009).

In this forest transition theory, five different stages can be identified:

- Stage 1: High Forest cover, low Deforestation rates (HFLD)
- Stage 2: High Forest cover, high Deforestation rates (HFHD)
- Stage 3: Low Forest cover, high Deforestation rates (LFHD)
- Stage 4: Low Forest cover, low Deforestation rates (LFLD)
- Stage 5: Low Forest cover, negative Deforestation rates (LFND)

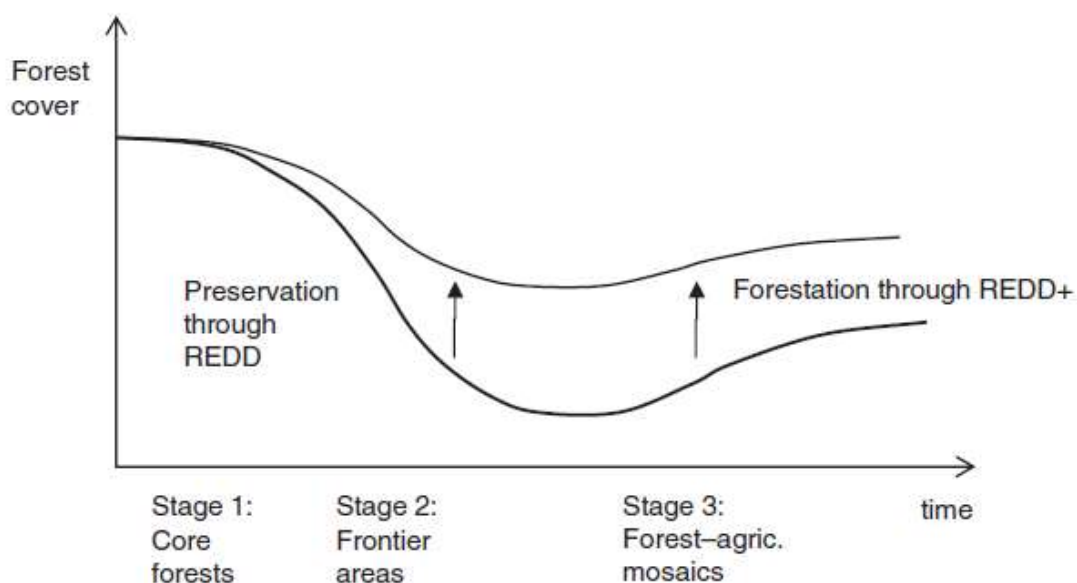
The forest transition theory helps to develop contextually appropriate policies and incentives to mitigate climate change through REDD+. At the first stages, REDD+ aims to reinforce the preexisting passive preservation of forests. In the next stages, priority should be given to establishing boundaries and creating reserves to prevent widespread conversion of forests. For example, policies that stimulate forest land development through agricultural expansion should be avoided at this stage, even though such action may require difficult choices between climate and poverty objectives. In the final stages of the forest transition, the restoration of environmental services through Payments for Environmental Services (PES) measures would assume more importance (see Figure 10).

Suriname is globally recognized as being a High Forest cover, Low Deforestation rate (HFLD) country. HFLD is defined as: "A developing country with more than 50% forest cover and a deforestation rate below 0.22% per year" (www.thereddorks.org). With a reported 14.8 M ha of forest cover (93% of its total area), Suriname is one of the most forested countries in the world. Historical deforestation has remained relatively low for the reasons explained below.

Suriname's HFLD status has a number of implications from a global perspective. In a global context of increasing demand for food and rising food prices, the political and economic pressures

to expand cultivated areas at the expense of forests is growing. Therefore, reversing the deforestation expected by HFLD countries is unlikely to occur unless global policy initiatives provide incentives for governments and landowners to retain or increase forests (Angelsen & Rudel 2013). This is precisely what REDD+ aims to do, and in the context of Suriname, the incentives must compensate avoided destruction of old-growth forests. In other words, according to the forest transition theory, REDD+ policy interventions should focus on preservation, as shown in Figure 10.

Figure 10 The forest transition with REDD+ policy interventions



Source: Angelsen & Rudel (2013).

Existing research at the global level highlights a number of general characteristics that can typically be expected of HFLD countries. These include low population densities, with the related remoteness of forests. A number of social characteristics have also been proposed as explanatory factors. These include a high correlation between poverty rates and forest cover (Sunderlin et al. 2008), poor access to government services and markets, low public and private investments, insecure land tenure, and relative difficulty in capturing potential forest rents (Angelsen & Rudel 2013). Further, because forest areas are remote in HFLD countries, governance challenges related to limited government capacity to implement measures and enforce regulations are generally perceivable at the first stages of the forest transition curve. Further challenges include corruption and lack of sound legal frameworks.

5.2.2 Suriname’s HFLD status and the country’s wider development perspectives

Suriname’s forests harbor significant levels of biodiversity, serve as an important carbon sink and maintain key ecological services, such as watershed protection, soil quality maintenance and climate regulation. These forests form part of the Guiana Shield, one of the largest contiguous and relatively intact forested ecoregions of the world.

Suriname's deforestation rate is still relatively low at between 0.02 and 0.06 % (SBB 2015) for the time period 2000-2013. The spatial analysis will verify and update this rate to the best extent possible. However, there is also general consensus that deforestation in the country is accelerating, especially in the recent past. According to the Foundation for Forest Management and Forest Control (SBB), the deforestation rate between 2000 and 2009 was estimated to be 3,000 ha/yr. Between the period of 2009 and 2013 this deforestation rate increased to 9,000 ha/yr (SBB), mainly attributed to mining and urbanization. There is a recognized risk that the trend of accelerating deforestation will continue as national development plans focus on infrastructure construction and engaging investors in extractive industries in forest areas. Arguably, the country is entering an era of increased economic and industrial development, and therefore needs to ensure that adequate forest protection and sustainable resource management systems are in place. Therefore, the purpose of this analysis is to look backwards for explanations for why Suriname has maintained its HFLD status, but also taking into consideration that history does not always provide a sound basis upon which to predict future developments.

The analysis shows that a number of contextual factors specific to the case of Suriname together explain the country's HFLD status. The main explanatory factors include policy, legal, biophysical, social, economic and infrastructure. These factors are explained in turn in the following sections.

5.2.3 Policy and legal framework

National development planning

The Government of Suriname (GoS) has recognized the significant role that its forests can play in the fight against climate change. In the Suriname's Intended Nationally Determined Contribution (INDC), the country explains that it aims to maintain its HFLD status, with REDD+ as a key mechanism to ensure this. This is closely linked with Suriname's National Climate Change Policy, Strategy and Action Plan (NCCPSAP), 2014-2021, which commits the country to a climate compatible development (CCD) approach. Although the OP 2012-2016 does mention REDD+ as a potential means to economic benefits for the country (ROS 2013), in this plan the Government of Suriname describes several development perspectives that relate to 'physical planning and environment.' (ROS 2012, section V6) Although these plans could be considered potentially huge drivers of deforestation, it is important to consider that the effective implementation of past multi-annual development plans has not been effective. The most recent multi-annual OP (2017-2021) is currently in draft stage and therefore, could not be evaluated for the purposes of this inception report.

In the 1990s, Suriname entered into an economic crisis, which led to the granting of large areas of forests to Asian timber barons. Anecdotal evidence suggests that this led to external pressure from environmental groups on Suriname to instead establish the Guiana Shield Initiative and thereby rather protect these forests from timber harvesting. Currently, Suriname plans to develop a Vision 2035, which could be based on a green development pathway, with REDD+ forming an important element of that development vision. Including REDD+ in this Vision 2035 may support the maintenance of Suriname's HFLD status by providing political support, similar to previous situations.

Legal framework governing forests

Stakeholder interviews generally confirm the perception that Suriname's legal framework is currently limited in its ability to ensure the sustainable use of forests. Nonetheless, it is important to explain the current legal framework, noting especially the legal framework governing forest use. A number of Acts aim to influence the status and use of forests. The Forest Management Act (1992) and its corresponding Ministerial Decrees dominate the legal framework. Other Acts or decrees include the Environmental Act, Mining Act, Trade in Goods Act, Timber Export Act, Planning Act and the Nature Protection Act. Five ministries are involved in the executing of this legal framework: the Ministries of Physical planning, Land- and Forest Management (RGB); Trade and Industry (HI); Finance (F); Regional Development (RO); and Public Works (OW) (Stoverinck, 2012).

The Forest Management Act (1992) covers the sustainable and rational use of forest resources, taking into account the interests of forest-dwellers and the conservation of nature and biological diversity. It provides rules governing timber production, timber processing and export. It covers the various licenses for forest product harvesting (including timber) from all different types of concessions and the use of community forests (ROS 1992). Forest use on private land is not regulated under the Forest Management Act (1992).

A national forest policy was adopted in 2005 after an extensive process of consultation with stakeholders. This policy provides broad guidelines for the use of forests for production, protection and conservation. According to the policy, the main goal of forest management 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". It contains economic, sociocultural and environmental goals of equal weight (ROS, 2013).

Institutional arrangements governing land and forest

With regard to forest ownership, forests in Suriname, except those on privately owned land, are under the responsibility of the Ministry of Physical Planning, Land and Forest Management (RGB). The control over forest management is mandated to the Foundation for Forest Management and Production Control (SBB). Before the establishment of SBB in 1998, forest management was under the responsibility of Land's Bosbeheer (LBB). Some of the original tasks are still under the responsibility of LBB, others have been redirected to SBB. Other tasks, such as infrastructure development in the interior, mining exploration and mineral resource extraction, have been transferred to other ministries or government agencies. This results in numerous overlaps for land use concessions, i.e. the Mining Law is above the Forest Law, resulting in mining concessions within logging concessions. The overlaps for land use concessions often results in a stagnation of land development activities and blocks investments in land productivity. Frequent restructuring of government institutions relevant for forest and land use also results in instability and insecurity, reducing the interest of private or government stakeholders to invest in the Interior. The overlapping mandates has resulted in overlapping concession rights, which reportedly has resulted in the stalling of land use investments in the recent past.

Enabling environment for private investment

Suriname's oversized public sector operates in most sectors of the economy, which has crowded out the private sector and acted as a brake on private sector investment (World Bank 2016). This

unfavorable business climate means that private investment in land productivity remains limited, maybe providing an explanation for why Suriname's forests have not been converted to other land uses such as agriculture. Further, key development partners have been hesitant to invest in sensitive high growth sectors such as the extractive industries and agri-business due to the high likelihood of reputational risks if tensions arise between the enterprises and local citizens. Social tensions and conflicts around extractive industries and agribusiness is a situation that has arisen many times in the region and has often been damaging to the image of key investors such as the World Bank. Given the sizable investments that could reach Suriname to exploit the vast natural resources of the country, sustainable resource management could be compromised by various interest groups. Although this has not yet materialized, the World Bank considers this especially alarming given the government's weak regulatory enforcement capacity, poor multi-level governance structures allowing for the effective participation of local communities (especially those in the Interior), the lack of rigorous strategic social and environmental impact assessment legislation (ibid.).

Conservation policy

Suriname's conservation policy is a potential contributing factor to Suriname's current HFLD status. However, the ability of protected areas to hold strong in the face of more economically valuable land uses can be considered limited, exemplified by the cases of Bigi Pan multiple use management area and that of Brownsberg Nature Park (see Infobox 1 and Figure 11). At present, Suriname has 16 legally established protected areas, and four proposed protected areas. The legally established ones cover 21,383 km² (i.e. 13.5 % of Suriname's land territory), and the proposed ones 1,320 km² (i.e. 0.8 %). The Central Suriname Nature Reserve, located in the Interior, is by far the largest, covering 15,920 km² (i.e. 9.7 %). The other reserves are relatively small, no larger than 1,000 km² (i.e. 0.6 % or less), and most of them are located less than a 100 km from the coast (ROS 2009). The extent to which this Protected Area (PA) network will contribute to the maintenance of Suriname's HFLD status into the future is unclear. See Section 5.3.3 for more information regarding the proposed PA network.

Ecotourism

Ecotourism relies on Suriname's impressive forest resource and biodiversity. Although still modest, the number of visitors entering for tourism purposes (tourist card holders) grew from 162.509 (2007) to 227.699 (2015); an increase of 71% (STS, 2015). This increase of visitors resulted in the establishment of a growing number of lodges and other forms of tourist accommodation in the interior of the country. The impact of this economic development on forests remains relatively low when compared to other land uses, especially gold mining. However, the potential localized economic impact of tourism may be important enough to stimulate local community conservation in cases of isolated protected areas with associated small and isolated human populations. Nonetheless, successful examples in Suriname are scarce. The best example is not forest-related but nevertheless relevant: the protection of marine turtles that nest along Suriname's coast, mainly in along the eastern part of the coast. WWF has been supporting turtle protection and numerous tour operators based in Paramaribo offer day trips to the turtle conservation area.

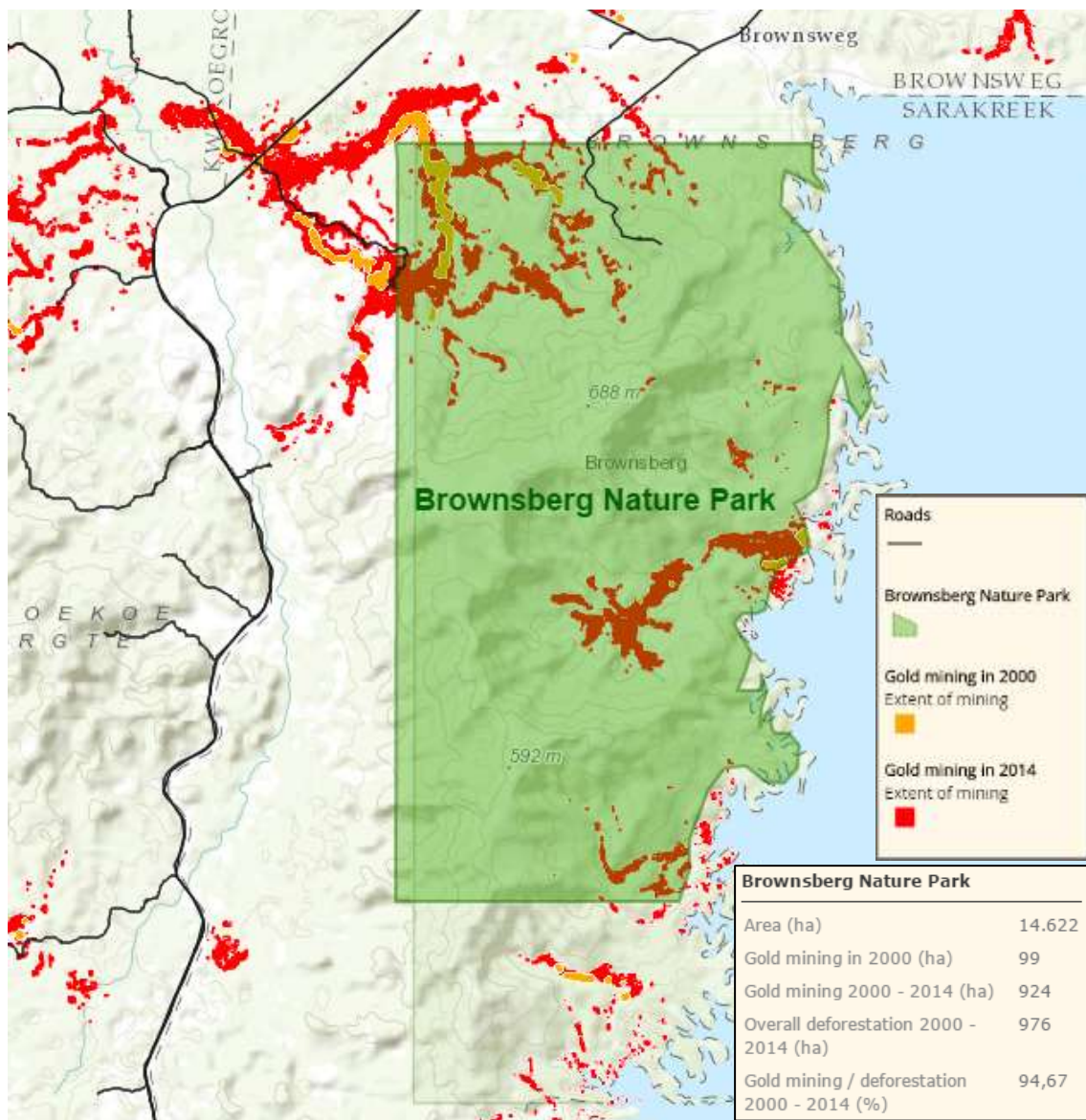
Infobox 1 Brownsberg Nature Park

The situation of Brownsberg Nature Park demonstrates that the creation of protected areas does not necessarily halt deforestation when more lucrative land uses are available and therefore, Suriname's conservation policy provides a weak argument for why Suriname has maintained its HFLD status. In 1970, an area of approximately 7,000 ha of forest that completely surrounds the Suralco mining concession was given in long-term lease to Stinasu, a government-linked nature conservation organization established in 1969. This area was named the Brownsberg Nature Park, and represents approximately 60 % of the current park, which was expanded towards the south in 2002 with 4800 ha. Nature tourism at Brownsberg Nature Park was developed soon after the establishment of the park and Brownsberg remains a popular tourist destination because of its wildlife viewing and waterfalls, but also due to its easily accessible location near Paramaribo. Beginning around 1999, artisanal gold mining made a dramatic resurgence in the Brownsberg area, including the park. The high level of the international gold price translated into the use of heavier equipment by artisanal gold miners. For the Brownsberg area, this has meant that teams of artisanal miners moved up the creeks with excavators, including in the park (up to some 100 m from trails used by tourists). Attempts by Stinasu to expel the Brazilian and local miners from the Park worked to some extent, but ejecting the local miners (maroons from Brownsweg) essentially failed. By 2000-2005, about 5 to 10 % of the Park area had been deforested by artisanal gold miners, in particular along creeks. Stinasu at some point proposed to excise approximately 1,000 ha of northwestern corner of the Park and allow miners to work there, by way of compensation for expelling them elsewhere. Since 2005 occasional "clean sweep" operations were executed in the park, which typically kept the miners out of certain areas for a few months at best. More recently, a new entity called Ordening Goud Sector was created to establish government control in areas where artisanal gold mining takes place. This entity continued the clean sweeps in Brownsberg Nature Park, but has not been more successful than previously the Stinasu had been with police support. A recent report (White 2012) drafted for WWF, provides the following explanations for the continued mining:

the Maroon population living near the park, mainly at Brownsweg, looks at the park as an alien construct in what they consider their tribal territory, where they claim land use rights based on traditional heritage; and artisanal gold mining in the general area, including the park, is the main source of income, either directly or indirectly, for many if not most of the local Maroon inhabitants, and there are virtually no alternatives, at least none that can compete.

This provides a glimpse into the challenges facing the GoS and conservation organizations in protecting high conservation value areas. However, it is important to note that Brownsberg should be considered a "worst case scenario" because it is located in the gold-rich Greenstone Belt. This case also explains why the GOS is hesitant to expand Suriname's PA network in the Greenstone Belt area despite the significant conservation value of these areas (Alonso & Mol 2007).

Figure 11: Gold mining overlapping Brownsberg Nature Park



Source: <http://amazonteam.org/maps/suriname-gold/>

5.2.4 Biophysical factors

A number of biophysical realities contribute to Suriname’s HFLD status. These include terrain (mountainous and steep slopes); edaphic (poor soils not suitable for agriculture); rivers (mainly rapid and not possible for transporting goods via shipping); and heterogeneous forest with many non-commercial tree species. composed of tree species not of interest for commercial production. The biophysical factors relevant to the HFLD status depend on the sector- with forestry, mining, agriculture and energy explained below.

Forestry

The exploitable Forest Belt (*bosgordel*), located above 4° N latitude, is a 40 to 100 km wide zone with forests on relatively accessible terrain (not too rugged, and a main east-west access road

cuts through most of it). It largely overlaps with the Savanna Belt (an area with in fact only 7% savanna) and with the transition zone between this belt and the more rugged land further to the south. The land further to the south (in particular below 4° N latitude) is especially difficult due to mountainous terrain. Below this line, commercial harvesting of timber is not considered feasible for various reasons. Rugged hills and rapids and the absence of land infrastructure render these terrains virtually inaccessible for logging (and to date also mining). The area is entirely devoid of roads beyond improvised roads created by small-scale gold miners; it can be accessed by small planes and via the rivers, but because of the many rapids, river access is difficult (only small boats can be used). This land has been, and largely remains virtually inaccessible for e.g. modern logging operations; timber stocks have not been inventoried there, and suitability for SFM remains uncertain. Fifty seven percent (57%) of Suriname's forests are below the 4° N latitude. This provides a strong explanation for HFLD, and generally confirms that forestry is not considered a potential future driver in this part of the country.

Agriculture

The Interior is generally considered unsuitable for (mechanized) agriculture, largely because the lateritic soils of the Precambrian Guiana Shield are of low fertility. Due to the lack of infrastructure and access to markets in these areas, the incentive to convert these remote areas land in the Interior are considered limited. The majority of suitable, readily accessible agricultural land remains in the Coastal Plain, where conversion has already taken place. Based on information provided by the Ministry of Agriculture (LVV), their priority is to first rehabilitate abandoned agriculture plantations (such as the palm oil plantations established in the 1970s), rather than opening up forest areas to establish new fields. Further, forestry concessions in the exploitable Forest Belt still contain unlogged forest that can easily be made accessible, where sustainable timber harvesting is more likely to continue as compared to agriculture.

Large-scale investments in oil palm have often appeared in Suriname's plans for development. For example, Asian investors are considering converting large tracts of forests to oil palm. Area estimates of forest designated to oil palm are available from SBB. However, the likelihood of these investments materializing in the near future is considered limited by numerous stakeholders interviewed.

Mining

Suriname's soil and rivers are rich in gold deposits. Approximately 24,000 km² of Suriname's territory is situated in the geological Greenstone formation that stretches over a surface of about 415,000 km² throughout Venezuela, Guiana, Suriname and French Guiana, as well as northern Brazil. Gold deposits are particularly concentrated in the east and center of the country, which is as well the most densely populated part of the interior. The fact that the Greenstone Belt covers a limited amount of land in Suriname mostly in the East along the border with French Guiana serves to explain why most parts of the interior remain intact.

Small-scale mining activities are concentrated in 14 gold operation areas. Moving from the western edge of the area towards the southeast we cross the basin of the Saramacca river, the Suriname river, Marowijne Creek, Sara Creek, Tapanahoni river, Gran Creek, Djuka Creek, Gonini river, Asisi Creek, Ulemari river, the Marowijne river and the Lawa river. In these basins between 800 and 1,200 small-scale gold exploration operations are taking place, each of which involves at least one exploration unit. Most units consist of a group of about six to eight man equipped

with a hydraulic machine. Operations are facilitated by easy transportation possibilities over waterways or roads. Construction of new roads will further expand gold mining into new areas. To date, mining activities have not taken place in the far South of the country as mineral deposits are considered relatively low. Especially as the Greenstone belt does not cover these areas, gold mining is not relevant. However, there may be exploration for other minerals in these areas, such as cobalt, which may have significant impacts on forest cover. But the information is limited.

5.2.5 Historical factors

Colonial heritage

Traditionally, the societies and economies of the Guianas have notably been orientated towards the Caribbean and the former colonial powers overseas and have been quite isolated from the rest of South America. This is reflected in the outlay of their infrastructure: possibilities to travel internationally by land to neighboring countries, especially southward, are limited, and so are the possibilities to travel beyond the coastal zone into the forested inland (van Dijck 2010). The low population density of the interior has historic reasons as well, as Europeans only colonized the readily accessible coastal area. Further, colonialization was accompanied by extinction of much of the Indigenous population throughout Suriname due to the spread of Old World diseases.

Ancestral land rights

According to the 2012 census, indigenous peoples comprise approximately 4% of the Surinamese population or around 20,000 persons. There are four distinct peoples (Kaliña, Lokono, Wayana, and Trio and associated peoples, e.g., Wai Wai and Akuriyo) living in around 51 villages. Suriname is also home to six tribal peoples referred to generically as Maroons: the Saamaka, N'djuka, Matawai, Kwinti, Aluku, and Paramaka. They number approximately 117,500 persons. Maroons are the descendants of African slaves who fought themselves free from slavery and established autonomous communities in Suriname's rainforest interior in the 17th and 18th centuries. The Inter-American Court of Human Rights recognized that Maroons are "tribal peoples" in *Moiwana Village* and *Sramaka People* (VIDS, VSG, FPP 2015). It should be noted that a substantial number of the Amerindians and the Maroons live in the coastal area and maintain limited contact with their villages of origin.

These indigenous and tribal peoples who live in the forest are the most disadvantaged sectors of Surinamese society, falling at the bottom of all economic and social indices. Their traditional rights to these peoples' ancestral land is an on-going and intensifying conflict in Suriname. These conflicts are relevant for a large part of the land in the Interior, which dissuades the public and private sector from investing in land productivity in those areas.

Political inertia

The effects of political inertia¹⁷ are discernible in Suriname, exemplified by the fact that many of the proposals laid out in the Multi-Annual OPs are not achieved. For example, in the Multi-Annual OP of 1975 (MOP 1975) the plan for a north-south connection between Paramaribo and the Brazilian border nearby Vier Gebroeders had already been mentioned (Van Dijck 2010). The reasons underlying such stagnations in political ambitions are manifold and complex. The fact that the majority of the large-scale plans for development through infrastructure and otherwise remain unachieved invariably contributes to Suriname's HFLD status.

5.2.6 Social factors

Demography

In Suriname, population pressure remains low, with only 3.1 person/km² (on 163,820 km² of land, Suriname has just about half a million inhabitants). In recent years, the annual population increase has been about 1.37 %. Approximately 90 % of the population lives in the Coastal Plain, in the north of the country; about 50 % lives in the capital Paramaribo itself (ABS 2010). The total population is 531,170, of which 265,953 lives in Paramaribo; 95,125 in Wanica; and 40,219 in Nickerie. The rate of urbanization is 1.44% per annum, and industrialization is limited. The Savanna Belt and the Interior of Suriname are thus thinly populated. Poor accessibility, and thus isolation of people who live there, and the infertility of the soils in the Interior and much of the Savanna Belt explains the low population density, as well as the reasons given in section 5.2.5 above.

Suriname's demography influences the housing sector, which has recently been documented by the SBB as a drivers of deforestation. Urban growth and housing development will likely continue to expand in the near future. However, the relative impact of this driver, especially in the dense forest areas of the Interior, is highly limited as Suriname's population growth rate is estimated at 1.05% (2016 estimate).¹⁸

Traditional lifestyle

A subsistence lifestyle is required for isolated communities to survive in the Interior, involving hunting, fishing and gathering of forest products, and typically also shifting (slash-and-burn or swidden) agriculture. This means that the land can support relatively few people in any given area, and that people (especially those engaged in agriculture) traditionally migrate, moving from an area they have temporarily depleted to a more pristine or naturally restocked area. At any given time, much of the land needs to remain fallow / unused for natural reforestation, as the restocking of flora and fauna resources takes place. However, the following Infobox serves to illustrate how (often contrary to common belief) traditional lifestyles can lead to forest degradation. This may be a minor driver at a national level, but a major one in specific areas.

¹⁷ Political inertia can be defined as a lag in political attitudes and legislation with respect to the demands of economic and technological or social change reflects the unwillingness of certain powerful groups with a vested interest in the status quo to change or to relinquish current benefits. It may also be a function of an outmoded or cumbersome political structure or of inadequate traditionalist opinions. It produces a barrier to economic, social and political progress and serves to maintain existing inequalities and injustices, ranging from poverty to pollution. Political lag can occur on either the national or the international level.

¹⁸ CIA World Factbook, Suriname page: <https://www.cia.gov/library/publications/the-world-factbook/geos/ns.html>

Economic opportunities in the Interior

What also keeps the population in the Interior low in modern / current times is the limited number of salaried employment opportunities beyond those in the logging and mining sectors (the biggest single employers are IAMGold, with an estimated 1,000 people with their roots in the Interior, and Surgold, which is / will be employing similar numbers; a few thousand people are involved in logging operations in the Savanna belt and Interior of Suriname). Before the recent gold rush in the Interior (since the mid 1990's), job opportunities, health and education services in Paramaribo drew people away from the Interior. The modern gold rush has somewhat reversed this trend, but it would seem mainly in relation to men. These men have not returned to their native communities, but to gold mining camps scattered throughout the Greenstone Belt. They are not engaging in a subsistence lifestyle there, contrary to what they would do in a traditional village. The small scale gold mining operations are transient, and rely heavily on the influx of supplies / consumer goods via Paramaribo (transported in by boat and plane). Numbers of 40 to 60,000 people (mostly men) involved in small scale gold mining in the Interior are often mentioned in recent years, but never substantiated; many of them are Maroons, as well as immigrants from Brazil (so-called *garimpeiros*).

5.2.7 Economic factors

National income and economic growth

Suriname has emerged as one of the Caribbean's best performing economies over the last decade, but poverty remains high, especially in the interior areas. Suriname, an upper-middle income country with abundant natural resources, recorded average growth of 4.4% for the period 2000-2012 and the per capita income of its population has risen concomitantly to nearly USD 8,900 in 2013 (World Bank 2016).

While high commodity prices have benefited Suriname for several years, and GDP growth is projected to peak at 5% in 2018, the medium term outlook remains mixed. Recent increases in the fiscal deficit and debt levels have exacerbated the country's vulnerabilities to commodity price fluctuations. The fiscal and economy-wide impact of a sharp decline in gold prices in 2013 led the government to implement fiscal measures to manage similar fluctuations going forward and highlighted the need for greater economic diversification.

Structure of the economy

Suriname's economic model is concentrated on enclave-based extractive industries with limited spillovers to the local economy (World Bank 2016). Extractive industries (gold, oil, and bauxite) play a dominant role in driving growth, employment and government revenues. These industries have mostly developed under an enclave-model with limited linkages to local communities, SMEs, and the local economy in general. This has been exacerbated by weaknesses in the quality of education that has created skills mismatches and therefore limited the ability of Suriname's labor force to take advantage of the strong economic performance of recent years. Reliance on natural resources also exposes Suriname's economic performance to commodity price fluctuations.

Mining is a vital sector of Suriname's economy and has grown significantly over the last decade, particularly gold mining, contributing an estimated 1.62 billion USD in 2012 versus 34 million

USD in 2000 (UNDP 2016). In 2011, small-scale gold mining was believed to provide 20,000 direct jobs as well as a significant number of jobs in subsidiary services. The majority of mining is taking place in Suriname's Greenstone Belt, in which the majority of gold deposits are believed to be found. Unfortunately, due to its largely unregulated and uncontrolled nature, mining, and in particular small and medium-scale gold mining (SMGM), is causing significant negative environmental impacts on forests, freshwater, fish and other groups of species. The economy is dominated by the mining industry, with exports of gold, and oil accounting for about 85% of exports and 25% of government revenues, making the economy highly vulnerable to mineral price volatility. Government's ambitions to increase exports from agriculture and further diversification of its production sector did not materialize as yet (EIU 2016).

5.2.8 Infrastructure

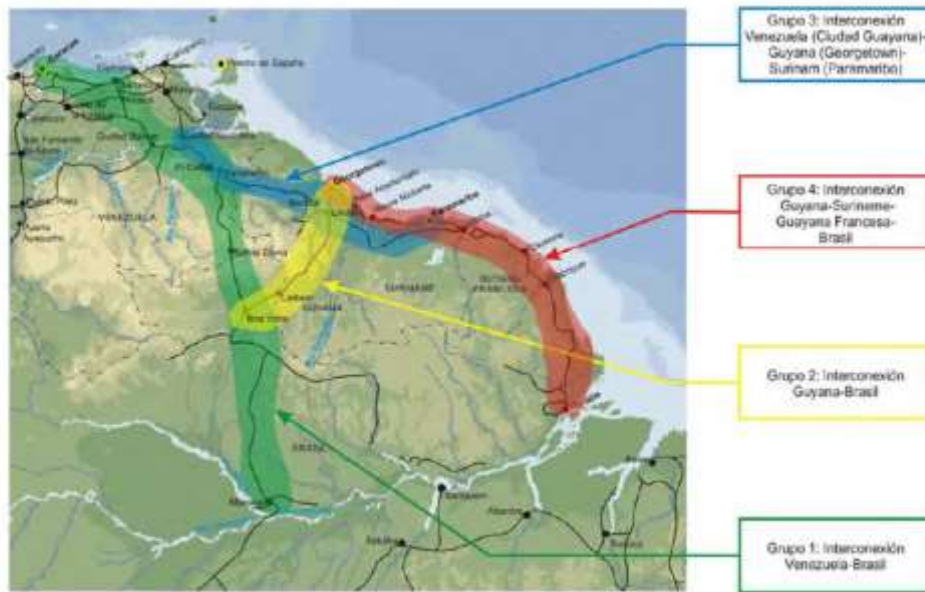
The stakeholder interviews carried out during the inception mission largely confirmed their understanding that accessibility is the key factor explaining the relative integrity of the expanse of remaining forests in Suriname. Therefore, the plans for infrastructure development in the Interior would have potentially enormous implications on Suriname's HFLD status moving forward. The unrealized plans for infrastructure development have long been on the table (see section 5.2.3). However, stakeholder interviews indicated that road construction in the Interior may begin in the near future. For example, the recently signed a loan agreement between the Government of Suriname with the Islamic Development Bank earmarks USD 300 million for road construction in the Interior. The proposals for this construction already exist and are currently being vetted by the Islamic Development Bank.¹⁹ Further, as logging activities move south, increased road building within and towards the concessions might be envisaged. These roads are often used by other sectors than mining.

The Initiative for the Integration of the Regional Infrastructure of South America (IIRSA) is a development plan to link South America's economies through new transportation, energy, and telecommunications projects (Van Dijck 2010). IIRSA investments are expected to integrate highway networks, river ways, hydroelectric dams and telecommunications links throughout the continent - particularly in remote, isolated regions - to allow greater trade and create a South American community of nations. See Figure 12 for a broad overview of IIRSA plans affecting Suriname.

The initiative was launched late 2000 with the participation of the twelve nations of South America. The initiative seems to lack funding, at least as far as implementation in Suriname is concerned, and the IIRSA plans for Suriname have remained largely unrealized. If realized in full, however, these plans will contribute to the accessibility of the inland and to the integration of the small countries at the northeastern edge of South America with the rest of the continent. Although the Inter-American Development Bank (IDB) is unlikely to fund this project, bilateral negotiations between China and Suriname indicate that the plans for building a road that connects Suriname to Brazil (Southern road) may soon come on line.

¹⁹ Information based on interviews conducted during inception mission.

Figure 12 IIRSA Guiana Shield Hub



Recent developments of infrastructure in the Interior include:

- the pavement of a number of roads such as the Afobaka road (Paranam to Afobaka dam), and the road to Brownsweg and Atjoni (till the SW edge of the Brokopondo lake);
- the upgrading / development of a dirt road that connects Afobaka to the Nassau mountains in the east of Suriname; this seems to be a private initiative related to the development of mining operations in this area;
- the creation of a dirt road along the right shore of the Suriname river (in progress); again a private initiative it would seem; and
- the creation of a dirt road to connect the Suriname and Saramaka rivers (in progress; starting at the SW edge of the Brokopondo lake; connecting Atjoni and Pusugrunu).

Relatedly, the Brownsweg-Pokigron Development Plan proposes the creation of a special development authority in charge with the infrastructure program for the Brokopondo hydro-electric lake and adjacent territories, involving ferry services and roads east and south of the lake to settlements at the shores of the Marowijne River and the Tapanahoni River. Two ferry connections are envisaged: a ferry from Brownsweg to Nassau. From Nassau a road can be constructed to Langatabiki on the Marowijne River with a side track to Nason; a second ferry will connect Brownsweg with Sarakreek. A road can be constructed towards Stoelmanseiland on the Marowijne River. Another road may link up with Drietabiki on the Tapanahoni River. The combination of the north-south road linkage with ferry services would turn Brownsweg into a region-wide centre for transportation, maintenance and storage, as well as a service centre. Further south, Pokigron is destined to become a service centre for the Upper Suriname river area.

Clearly, the pavement of the Paramaribo-Pokigron corridor may have a significant impact not only on the territory adjacent to the road itself but on a much wider area that will become better accessible through related infrastructure. These areas adjacent to the lake have been opened up already by a large number of tracks constructed by groups of gold miners active in that area.

These roads facilitate transport of inputs for gold exploitation and the large numbers of individuals active in these small-scale operations. Not unlikely, spread effects will extend to the south of Pokigron into the interior. As these developments improve access to parts of the interior, increased deforestation is expected to occur by creating opportunities for other types of development (mining, logging, agriculture).

Other projects which are on hold or were abandoned would also have led to new road development in the Interior:

IIRSA e.g. envisaged a road to Brazil via the south of Suriname, this so-called North-South Linkage from Paramaribo along the Brokopondo storage lake southwards to the Suriname-Brazil border nearby the village of Vier Gebroeders at the foot of the Tumucumac Mountain range has not yet been included in the IIRSA agenda but is still among the priorities of the Suriname government (van Dijck 2010);

the abandoned Nassau bauxite mine project envisaged a haulroad to be built between Paranam and the Nassau mountains; and

the Bakhuis bauxite mining project, if revived, would result in the reconditioning / re-opening of roads from Apura till the Kabalebo river, and would possibly lead to the rehabilitation and pavement of the road from Zanderij to Apura (the 'road to West Suriname'). Pavement of the latter will have a large impact on the area which has several connecting roads to villages such as Kwakoegron and Donderskamp.

It is obvious that a revival of such projects would lead to more direct and indirect deforestation. Among the major risks are extension of the urban growth of Paramaribo, unsustainable forestry, degradation of traditional authority and customs, increased poaching and wildlife trade, increase of area under shifting cultivation and degradation of natural areas. The revival of these projects is likely linked to international commodity prices, specifically those of gold and aluminum. From an economic and social perspective, the proposal coastal corridor is by far the most important of the three corridors as about 80% of the entire population of Suriname is concentrated along this road. A well-functioning road connecting the towns and villages along the coast potentially contributes to the development of the economy as a whole in a significant manner. Much of the environment in this relatively densely populated stretch of land is degraded but there are nevertheless environmental stretches along the coastal line worthwhile safeguarding, especially mangrove ecosystems.

It is important to note the interlinkages between these infrastructure plans and the enabling environment for private investment explained in section 5.2.3. Infrastructure plans and proposals should be put in the context of production and investment plans of private sector stakeholders. The planned road infrastructure in the east, southeast and south Suriname may not always be part of a comprehensive or strategic regional development plan but are rather based on decisions taken by independent stakeholders including the government, small scale gold miners and large scale corporations involved in gold exploitation, exploitation of bauxite and other natural resources, production of hydro-energy.

Energy production

The second main component of the IIRSA plans involves the enlargement of Suriname’s capacity to provide electricity for domestic and international consumption. The Tapajay hydropower project (on hold) requires the building of roads to the Tapanahony river (in the south of Suriname). In the southeastern part of the country, diversion of the flow of rivers including the Tapanahoni river may contribute to the storage capacity of the Brokopondo lake and enlarge the capacity to export energy to French Guiana and Guiana. In the west of the country, the proposed hydroelectric plant may contribute as well to energy production and export capacity. The Kabalebo hydropower project, if revived, would result in the re-opening of a road that goes all the way till the Lucie river (to a point near the middles of the western border of Suriname).

Since Suriname does not have significant topographic elevation changes in the areas relevant for new hydrodam construction, efficient energy production would require a large-scale lake. The resulting impacts on forests in terms of flooding would be immense. Therefore, the argument for constructing another hydrodam is relatively weak in Suriname, especially given neighboring countries such as Brazil do have the elevation conditions to build a more efficient dam. However, as Suriname embarks on an ambitious plan to expand renewable energy production (ROS 2015), it is unclear whether hydropower dams would fall under the definition of ‘renewable energy.’

Oil and gas exploration / exploitation can be considered a driver of deforestation to a very limited extent, and only in relation to the Coastal Plain. Staatsolie Ltd. has been drilling onshore mainly in Western half of the Coastal Plain. To access drill sites and place pipelines, some deforestation has taken place, and will continue to take place for the next few decades, as new drill sites are progressively made operational. There is only limited information on ongoing operations in the public domain, especially on how any rehabilitation is proceeding.

5.2.9 Summary explanation of Suriname’s HFLD status

As one of the three countries in the world classified as HFLD, Suriname provides a unique opportunity to maintain some of the world’s most important biodiversity and freshwater resources while simultaneously avoiding significant greenhouse gas emissions. However, deforestation and forest degradation are of increasing concern in Suriname, in particular due to increasing gold mining activities (Rahm et al. 2015). In Suriname’s current context of economic hardships, it is important that the country does not turn to allotting large-scale forest concessions with the aim to stimulate foreign direct investment. A similar situation was visible in the early nineties, when Suriname granted 25-40% of the country’s forest area to Asian logger barons (ROS 2013). Table 7 below provides a summary of the main factors influencing Suriname’s continued HFLD status.

Table 7: Summary of explanatory factors for Suriname’s HFLD status

Factors (general categories)	Column heading
Policy and legal framework	<ul style="list-style-type: none"> ▪ National development planning ▪ Legal framework governing forests ▪ Institutional arrangements governing land and forest ▪ Enabling environment for private investment

Factors (general categories)	Column heading
	<ul style="list-style-type: none"> ▪ Conservation policy
Biophysical	<ul style="list-style-type: none"> ▪ Terrain (mountainous and steep slopes) ▪ Edaphic (poor soils not suitable for agriculture) ▪ Rivers (mainly rapid and not possible for transporting goods via shipping) ▪ Highly heterogeneous forest composed of many non-commercial tree species ▪ Major land use sectors affected: forestry, mining, agriculture
Historical	<ul style="list-style-type: none"> ▪ Colonial heritage ▪ Ancestral land rights ▪ Political inertia
Social	<ul style="list-style-type: none"> ▪ Demography (low population pressure) ▪ Traditional lifestyle ▪ Economic opportunities in the Interior
Economic	<ul style="list-style-type: none"> ▪ National income and economic growth ▪ Structure of the economy
Infrastructure	<ul style="list-style-type: none"> ▪ Roads, transportation networks ▪ Energy production (hydrodams)

Note: These factors have not been listed according to order of importance.

5.3 Overview of REDD+ eligible activities in Suriname context

The objective of this section is to introduce the five eligible REDD+ activities²⁰ in the context of Suriname with the aim to demonstrate the general direction that REDD+ is taking (or may take) in Suriname so as to guide the remainder of this DDFDB+ study. The general status and respective relevance of each activity is described in turn, followed by a preliminary assessment of the main barriers and challenges related to these activities. This barriers assessment is complemented with a preliminary assessment of opportunities related to each activity. The reason for providing this very preliminary assessment so early on is to guide the rest of the assignment in a way that allows for placing attention on certain issues. Also, this allows SBB and other key stakeholders to provide feedback early on in the assignment on these substantive issues. This barriers analysis will be enhanced with more information and further refined in the final report. It is important to note that although the UNFCCC outlines that REDD+ comprises five potential activities, the guidance surrounding the definition of these activities is limited. Defining certain REDD+ activities at the international level is challenging, exemplified by how the Food and Agriculture Organization of the United Nations (FAO) attempted to inform the definition of the term “forest degradation.”²¹ So as definitional issues do not become constraints, REDD+ countries are encouraged to define the relevant activities within their country contexts (Morales-Barquero et al. 2014).

5.3.1 Reducing emissions from deforestation

The conversion of forest to other types of land uses entails deforestation. More specifically, deforestation has taken place whenever a previously area designated as forest no longer meets Suriname’s forest definition criteria, which are: minimum surface: 1 ha, minimum tree crown cover: 30%, minimum tree height: 5 meters (UNFCCC standard definition) (SBB 2015). Over the last decades, the main drivers causing this conversion include energy generation, agriculture, and mining. These are described below in turn, followed by a summary of barriers and opportunities related to this activity.

Energy generation

Regarding energy generation, the most significant single deforestation event since the beginning of the 20th Century has been the establishment of the Brokopondo hydro-electric reservoir (a.k.a. Brokopondo Lake) in the 1960’s. A total area of some 135,000 ha of mostly virgin forest - but also 21 Maroon villages and associated swidden agriculture fields along the Suriname river - disappeared under water once dam construction at Afobaka was finalized in February 1964. The only thing that remains of this forest are hundreds of forested islands (ranging from less than one ha to roughly 10 ha in size). This project was originally intended to provide energy for the then flourishing bauxite industry, and was critical for the smelting of alumina in Suriname to produce aluminum (at the Suralco plant in Paranam). However, the smelting of alumina was entirely abandoned in Suriname during the 1990’s, and ever since, much of the power generated

²⁰ 1) Reducing emissions from deforestation; 2) Reducing emissions from forest degradation; 3) Conserving forest carbon stocks; 4) Sustainable management of forests; 5) Enhancement of forest carbon stocks.

²¹ See <http://www.fao.org/docrep/009/j9345e/j9345e08.htm>.

at Afobaka feeds into the national power grid to service mainly larger Paramaribo. Currently, the plant in Paranam is virtually closed, and Suralco, the last remaining bauxite company in Suriname, has stopped mining. However, since the early 2000's, power is also supplied from Afobaka directly to the IAMGold gold mine at Gros-Rosebel. Rising power demands in larger Paramaribo and an increasing large-scale gold mining activities (if gold price continue to rise as they have done since late 2015) increasingly pressure the GoS to increase hydropower capacity. At various times - most recently in 2011 - the so-called Tapajai project has been under consideration. The construction of this dam would flood another roughly 26,000 ha of forest (in the Tap-anahony river basin) and would redirect water to the Brokopondo lake to enhance the reservoir's capacity. While the Tapajai project is one of the major projects presented in the 2012-2016 OP with the aim to secure the country's near-future electricity needs, the project was shelved in 2012 as a consequence of social and political 'red flags' that went up during the feasibility study phase.

Another hydropower project that is often mentioned is the Kabalebo project. This project was originally (1970's) envisaged as an essential part of a larger strategic 'West Suriname' program to develop a new industrial and urban center in the west of Suriname. This program includes bauxite mining at the Bakhuis Mountains in West Suriname, and possibly smelting the bauxite nearby; cheap energy from a nearby hydro-electric facility was and still is considered essential for this. This program was partially initiated but abandoned in the 1980's; none of the three projected Kabalebo hydropower reservoirs was ever built. The program was partially revived in the mid-2000's when BHP-Billiton did extensive exploration for bauxite at Bakhuis and developed a feasibility plan for bauxite mining. The plan was abandoned before the end of the decade, at a time when commodity prices were high, and is not likely to be revived soon, given that commodities like aluminum have been fetching much lower prices on international markets in recent years. If the demand for aluminum products picks up, however, a mine at Bakhuis would likely be targeted for development, leading to the building of new reservoirs and deforestation (of up to an estimated 200,000 ha). The GoS has an agreement with Suralco that both will jointly develop a feasibility plan for a Bakhuis mine over the next two years, and will both seek investors for such a development.

Agriculture

The contribution of agriculture to deforestation was more significant historically, but the prospects for agriculture expansion in modern times is limited for various reasons- including Suriname's trade balance, relative competitiveness and low population. However, it is important to note that the national development strategy emphasizes agriculture development. Historically, from the 17th till 19th Century, a substantial area of forested land in the Coastal Zone of Suriname was cleared and transformed into plantations (mostly to plant cash crops such as sugarcane, but also coffee, cocoa, etc.). By the mid-20th Century all but a few plantations had been abandoned; these have spontaneously reforested, except small parts where people stayed to engage in subsistence farming, and larger parts near the capital that have gradually become part of greater Paramaribo.

In the early 1950's, roughly 18,000 ha of polders (cleared land under a managed water regime) had been developed and planted with mechanized rice cultivation. By the mid 1980's, mainly in the northwest of Suriname, some 48,000 ha of land had become wet polders for rice cultivation

(ROS, 1988). After this initial period of fast development of the rice sector in Suriname, the development of wet polders has expanded only minimally – the LVV mentions 50,790 ha in use in 2014. The main bottlenecks that hinders the further expansion of the Suriname rice sector since the late 1980's are high production cost, low international prices (mainly due to low labor cost in the most productive region, Asia), lack of cooperation among producers, and limited national subsidies. These bottlenecks are likely to remain, and thus an expansion of polders and associated deforestation is not expected in the near future.

Banana plantations were established in Suriname in the 1960s, with a total area of 2,000 ha currently under production in the Coastal Plain. Prospects for expansion are limited since international market is very competitive. Suriname provides no subsidies and has a relatively high labor cost (compared to regional competitors). Further, Suriname faces many issues with diseases (including a recent outbreak that risks wiping out entire banana plantations). Thus, this crop is not considered a significant driver of (continued) deforestation.

In the 1970's and 1980's, three oil palm plantations were established in the Interior of Suriname, for which in total approximately 8,000 ha natural forest was cleared. These plantations faltered at the time due to a combination of persistent outbreaks of spearrot disease, and hinterland war that took a hold of Suriname's Interior from 1986 till early 1990's. Spearrot disease can at present be prevented by using resistant oil palm varieties. The period of hinterland war ended during the mid-late 1990's and the current government is looking into the possibilities to rehabilitate and extend these plantations. For the development of an oil palm plantation, including processing and refinery activities, in 2011 the Investment group China Zhong Heng Tai (CZHT) was granted an Incidental Cutting Licence (ICL) over a forest area of 45,000 ha in the Patamacca region in the Marowijne district. This area is additional to the 6,000 ha of the (former) Patamacca Palm oil estate. According to SBB statistics, in 2013 CZHT had become one of the major loggers in Suriname, but oil palm plantation establishment has not yet started. The high international demand and price for palm oil drives an expansion of oil palm plantations internationally, which may soon be reflected in the case of Suriname. However, local labor shortages and limited acceptance of foreign laborers in the case of CZHT has halted palm oil expansion until now. These however do not seem to have prevented certain companies with formal plans and licenses to deforest.

In the 2012-2016 OP, the Government of Suriname presents its ambition to become the 'granary' of the Caribbean (CARICOM) region (ROS 2012, p. 70). Although little of this ambition has materialized yet, it may represent a driver for deforestation. Due to the many unresolved land tenure issues, prominently the issue of allodial land ownership (Ramautar, 2015), the availability of arable land in the coastal zone of Suriname is limited. The total agricultural area is around 150,000 ha. Forest clearing for agricultural development may provide an easy way to get around these problems. Further, incidental developments during recent years include the felling of (secondary) forests in the Tibiti region for the establishment of citrus- and guava plantations; further to the west, new plantations are planned (3,500 ha).

Mining

Considering the historical impact of hydrodam construction, mining (including open pit mining and disposal of mining waste) is considered the second largest cause of historical deforestation in Suriname and by far the most significant driver in modern times. In the period 2009-2013, the average annual forest loss is estimated at 9,591 ha (annual deforestation rate 0.06%), of which

73% is estimated to be caused by gold mining; in the preceding years (2000-2009), the annual rate was 3 times lower (0.02%); due to such low deforestation rates, the percentage of the country covered with forest has remained constant at 94% these last decades (SBB, 2015). So, although gold mining is a serious cause of deforestation, its rate has remained too limited to threaten the country's HFLD status. This said, the trend in the deforestation rate appears to be strongly increasing, and if it continues to increase linearly, the annual deforestation rate (mainly due to gold mining) may exceed 0.5% around 2025 (total forest cover will by then have fallen below 90%). It should be noted that there is an absolute limit to gold mining-related deforestation, due to the fact that gold bearing geological formations (Greenstone Belt) occupy no more than about 7% of Suriname's land surface (excluding the Brokopondo lake, which is located in the Greenstone Belt). It is important to also note bauxite mining concession (including Bakhuyss/Nassau) where the operations have not started.

Summary of avoided deforestation in the context of REDD+

By far the most important driver of deforestation is gold mining with the highest contribution of small and medium scale gold mining (SMGM), which also results in significant social and environmental harms (Rahm et al 2015). Although energy generation and agriculture have caused deforestation in the past, the impact of these drivers in the recent past (i.e. last 10 years) has been limited and is generally expected to remain limited in the near future. However, it is important to note that the GoS does plan to significantly increase agriculture production and the prospects for building a new hydrodam is likely to remain in the upcoming OP (to be confirmed in the final report).

When considering mining as a main deforestation driver to be addressed by REDD+ in Suriname, it is important to also take into account the link between road construction in the Interior and SMGM expansion into forest areas. The impact of road construction in itself may not be a major drivers of deforestation, but the fact that accessibility and product transportation is facilitated by roads means that gold mining and possibly other activities such as agriculture may increase substantially as a result of road construction. This analysis will be expanded in Task 2.

5.3.2 Reducing emissions from forest degradation

A reduction in the forests' ability to produce goods and services, and especially the reduction in carbon stocks, entails degradation. In the current context of Suriname, the main degradation driver are forestry activities, i.e. timber extraction or logging. Another potential driver of degradation is shifting cultivation in the Interior when fallow cycles are too short, which entails deforestation to some degree, but has been considered degradation in Suriname's Interior.²² In this sense, the main distinction between deforestation and forest degradation is the permanence of changes in forest cover, with swidden agriculture entailing only temporary changes. However, the definition of degradation (similar to the definition of forests) is left to the discretion of Suri-

²² The exact reason for why shifting cultivation was not considered deforestation needs to be clarified. It may partially be due to the reversion of cleared forest to fallow after only a few years.

name. While conceptually distinguishing between deforestation and degradation is straightforward, the interlinkages and feedbacks between them depend on nuances and contextual factors, and may be important to consider.

In the case of forestry, it is important to highlight that the scope of this degradation driver is limited in the sense that at least 70% of Suriname's forest cover is excluded from forestry, as 13% is PA and the remaining 57% is below the 4° N latitude, where access is especially difficult due to mountainous terrain. In the remaining so-called Forest Belt, timber harvesting is generally conducted by selective logging. The National Forest Policy (2005) assumes a potentially annual sustainable cut of 1.0 - 1.5 M m³ based on a cutting cycle of 25 years and a logging intensity of 10 to 15 m³/ha if a steady expansion of the package of currently lesser used species is realized. The Forest Management Act (1992) allows for an annual cut of 25 m³/ha, which is still far greater than the current annual harvest (timber production details to be provided in the final report). In 2011, Suriname presented its National Code of Practice (CoP) for sustainable forest management. The CoP describes the best practices for SFM and is applicable to all types of timber harvesting permits (SBB, 2011). The overall implementation status of the CoP, including degree of enforcement, will be further described in the final report.

According to the 2014 SBB statistics, 1,655,000 ha of forest concessions were granted for the purpose of commercial logging. Additionally 612,000 ha are registered community forests (SBB, 2015). Forest management regimes can be divided in three distinct levels (see also section 1.3):

Conventional logging: logging without management planning;

Controlled logging: logging based on management plan and annual cutting plans;

Certified logging according to international (FSC) sustainable forest management standards.

Supported by the Sustainable trade Initiative (www.idhsustainabletrade.com), close to 430,000 ha of Suriname timber concessions are FSC certified (2015) and managed accordingly. The remaining concession area (1.2 M ha) is managed under the system of controlled logging, based on the principles of the CMS and described in the CoP. Community forests (0.6 M ha) are conventionally logged. These figures illustrate that there is great potential for SFM as one of the REDD+ eligible activities. The final report will describe in detail the different types of logging practices, and their respective impacts on the forest in terms of degradation will be thoroughly analyzed.

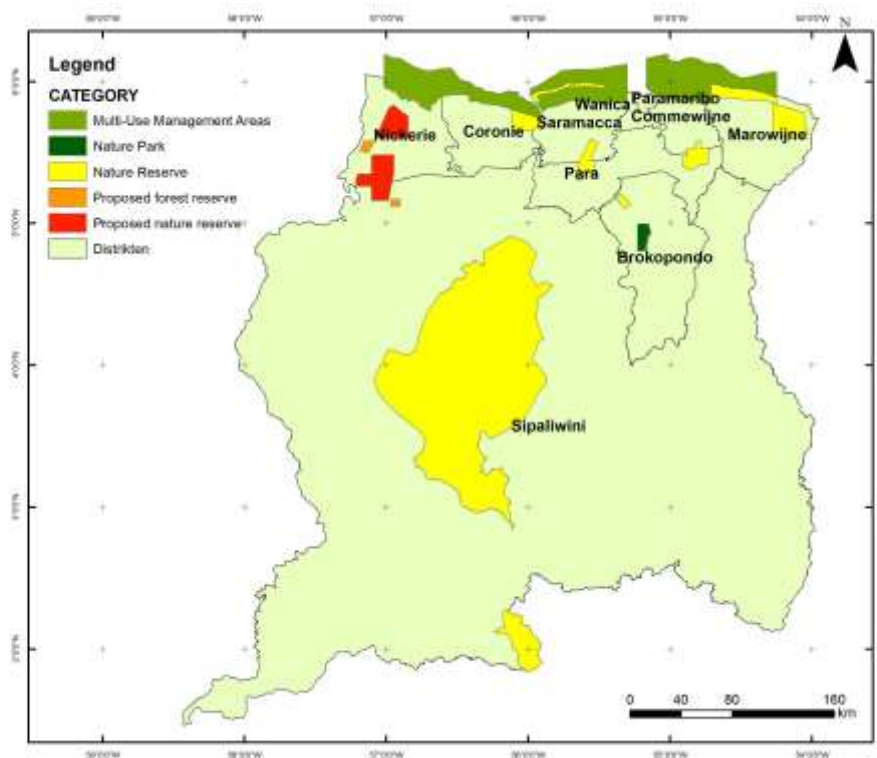
In terms of barriers to addressing degradation and potential future threats in this regard, until present, the harvesting volumes are limited to 12-16 m³. However, in the near future, timber harvesting rates may increase. Currently, only about 30 tree species are commercialized and traded, both domestic and globally. Ongoing research into the use of lesser known timber species (Probos, 2015) aims at increasing the harvesting levels, thereby also improving the business case for forestry in Suriname. Of the >400 tree species that can be found in Suriname's forests, about 80 of them are considered (potentially) commercial species. Additionally, the international interest in the harvesting of woody biomass for energy from Suriname's forest is potentially growing. The potential threat is that the harvesting of biomass for energy may include the collection of branches that currently remain in the forest. It is not clear as of yet if this would result in more forest degradation. However, it is highly unlikely that harvesting for biomass would result in cutting in natural forests. Rather, biomass production for energy is usually based on plantation establishment.

In terms of sustainable forest management, which has many overlaps with section 5.3.4 “Sustainable Management of Forests,” enhancing SFM-certification is challenging. Domestic markets, both public and private, do not ask for sustainably sourced timber (products) yet. The majority of present export markets (mainly Asian) do neither. Incentives need to be developed to motivate more logging companies to engage in (certified) SFM. Special attention should be given to small concession holders and the position of community forest. For these, group certification might be an attractive option. At present, some communities are investigating the possibilities (oral comm. Mr. Lazo, Santigrón communities).

5.3.3 Conserving forest carbon stocks

The main actions relevant for this REDD+ activity relate to the establishment and improved management of Protected Areas. Suriname has 16 legally established protected areas, and four proposed protected areas (these have been proposed since the early 1980’s). The legally established ones cover 21,383 km² (i.e. 13.5 % of Suriname’s land territory). The Central Suriname Nature Reserve, located in the Interior, is by far the largest, covering 15,920 km² (i.e. 9.7 %). The other reserves are relatively small, no larger than 1,000 km² (i.e. 0.6 % or less), and most of them are located less than a 100 km from the coast; the notable exception is the Sipaliwini Nature Reserve in the south of Suriname, which was established to protect Suriname’s largest savanna landscape (ATM, 2009).

Figure 13: Suriname’s current Protected Area Network



Source: data provided by SBB, map produced by UNIQUE.

The different types of protected areas differ in legal status and management regime (Figure 13). The following provides an overview of the different types of legally protected areas in Suriname:

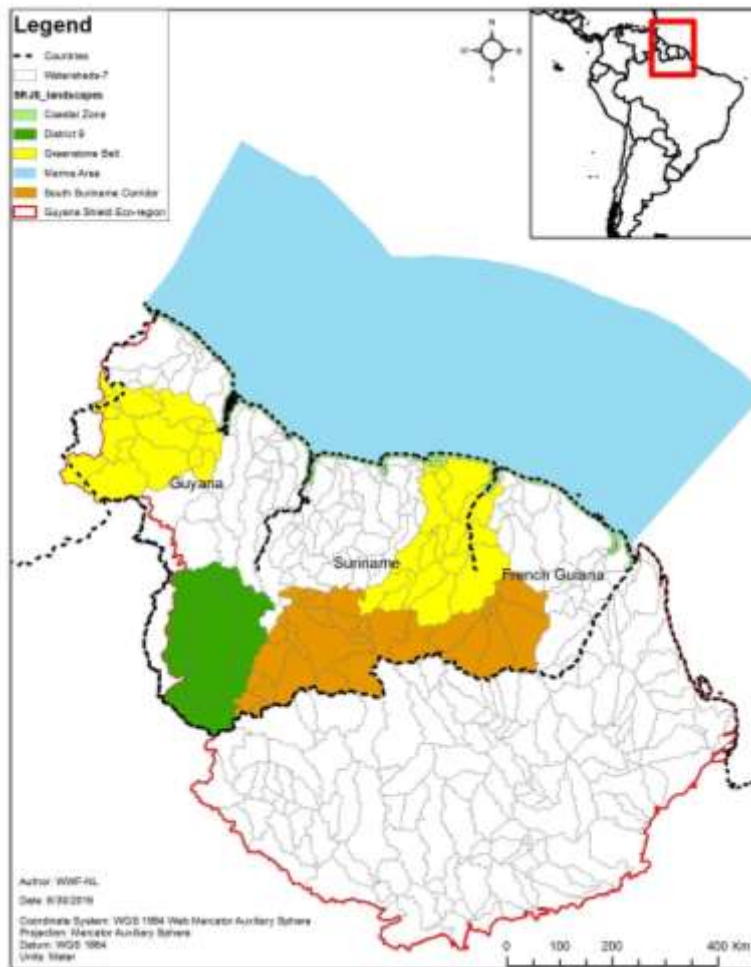
- Nature Reserves (NRs), established based on the Nature Conservation Law: NR is the oldest form of protected area in Suriname; formal protection is complete, although traditional activities by Indigenous or Maroon inhabitants are allowed, alongside limited scientific and nature tourism activities; the Nature Conservation Division (NCD) of the Forest Service (LBB) is formally in charge of the overall management on behalf of the State; nature tourism activities in the NRs are managed by Stinasu, the Foundation for Nature Conservation in Suriname; at several NRs, NCD has set up field stations, which are occasionally or seasonally manned by game wardens; so-called Consultation Committees (CCs) have been established as a forum for discussion and conflict resolution between the NCD, the local population, and other actors or stakeholders (two protected areas have or at least had CCs but at least one is not functioning anymore); management plans have been developed for about half of the NRs, but most are outdated, and it is unclear to what extent they are still being implemented; the most actively protected NR is Galibi Nature Reserve, where NCD's marine turtle protection activities are supported by WWF and (part of) the local Indigenous community.
- A Nature Park is established on the basis of so-called Land Reform Decrees (1982). The only Park in Suriname is Brownsberg Nature Park (see Infobox 1), which is part lease and part concession of Stinasu (although this concession is contested); Stinasu is the park manager, and has developed it for tourism, research and nature education; formal protection is not as strict as in a NR; the local Maroon community used to interact formally with the BNP manager via a local umbrella CBO, but currently contacts seem to be informal; the management plan for BNP has last been updated 10 years ago and does not seem to be implemented anymore.
- Multiple-Use Management Areas (MUMAs), established on the basis of Land Reform Decrees (1982): MUMAs typically have complex ownership and are "areas where integrated management by or on behalf of the Government is needed for a rational use of its natural resources"; protection aims at keeping the ecosystem functionally intact and productive, to ensure the survival of vulnerable wildlife populations; for all the MUMAs, management plans have been developed, all of which are outdated and at present do not appear to be implemented anymore. Formally, LBB should coordinate the management of MUMAs. The LBB's NCD has played an important and active role in the management of the Bigi Pan MUMA for decades. However, the extent to which further coordination of the MUMAs management happens is still unclear.

Not included above are two areas of Special Protected Forest (SPF), established based on the 1992 Forest Management Law: two areas with sustainable forest management research plots have been designated SPF recently (around 2012). The areas are respectively Kabo (1500 ha) and Mapane (1100 ha). There are other plans for establishing additional, more substantial protected areas; these have been developed recently or are being developed, but have not yet come to fruition:

- Proposed law to protect coastal zone
- Protection of a larger area with freshwater and forest ecosystems in West Suriname, instead of, yet including parts of areas proposed for protection earlier (cf. above); this initiative was supported by WWF, but ran into opposition by local communities around 2011;

- Protection of Coronie Swamp, the largest freshwater swamp of the country; this project is more of a grass-roots project that is still being developed;
- Protection of a vast forested corridor between CSNR and protected areas across the south-southeastern border of Suriname (in Brazil and French Guiana); this is an ambitious project that is being developed and pushed by WWF and CI (Conservation International). They are currently engaging two indigenous tribes (8 villages) in the establishment of this area. Often termed the South Suriname Conservation Corridor, the proposed PA covers 7 million ha (45%) of the country, (based on information received during interview with WWF).²³

Figure 14: Proposed South Suriname Corridor



Source: WWF Guianans.

With regards to barriers, recent developments suggests national political support – and sometimes local community support - for establishing additional protected areas in Suriname appears to be limited. National politics is more focused on advancing projects with more obvious economic benefits (such as in the mining sector), and many local communities have given priority to resolving so-called land rights issues (under the current legal regime, they often see

²³ As indicated, this information is based on a discussion with WWF and not on an official Government document.

protected areas close to their communities as an infringement on their land rights). It is thus no surprise that recent initiatives supported by major NGO's such as CI and WWF have not come to fruition yet. This also helps to explain the limited efforts at on-the-ground protection of existing protected areas, at updating protected area management plans and implementing them. Rahm et al (2015) state that 985.3 ha of Suriname's PAs overlap with the Guiana Shield's Greenstone belt, which often results in considerable deforestation due to gold mining (Figure 11).

5.3.4 Sustainable management of forests

The sustainable management of forests in the context of REDD+ is a very broad term and can entail many different activities. The definition of this activity depends on the objective of management. In the Bali Action Plan context, it refers to the application of forests management practices for the primary purposes of sustaining constant levels of carbon stocks over time.²⁴ Given the significant amount of forests already designated as timber concession in Suriname, it would make most sense for this activity to mainly entail the sustainable management of forest for timber production purposes. Given sustainable forest management for timber production is also the main action relevant for avoided degradation, the status, potentials, barriers and opportunities relevant for this REDD+ activity are generally the same as those described in the avoided degradation activity described above in section 5.3.2.

5.3.5 Enhancing forest carbon stocks

Afforestation and reforestation (A/R) are the main interventions relevant for this REDD+ activity. Due to the nature of Suriname's dense forests, timber harvesting is low intensity selective logging, in which systems for A/R have no role. In the early 1960's some experiments were done on enrichment planting. After logging, logged over forest were artificially 'enriched' by the planting of seedling of potentially commercial tree species. All experiments failed; young seedlings lost the competition for light, water and nutrients from natural regeneration of these forests. Therefore, silviculture treatments as a REDD+ activity must be further assessed.

In the 1970's, several forest plantations have been established in deforested areas for that purpose. By the early 1980's, there were 13,000 ha of plantations of which close to 7,000 ha was planted with Caribbean Pine (*Pinus caribaea*; an introduced species) and formally managed by the national BOSMIJ NV., then under the responsibility of LBB. After a promising start, growth rates declined and nowadays these plantations have been neglected and no thinning has taken place since the 1980's. The future of most plantations is uncertain (NFP, 2005). At present, A/R is not an issue within the national forest authorities.

A/R however plays an important role in the rehabilitation of abandoned mining areas. Such rehabilitation is mandated by corporate social responsibility policies of large mining companies that have been (BHP Billiton) and are active in Suriname (Suralco, a subsidiary of Alcoa;

²⁴ <http://www.fao.org/forestry/18938-0efeb18b14c2ad28b0a2f2ce71b136f2e.pdf>.

IAMGold, and Surgold, a subsidiary of Newmont). At Suralco’s old bauxite mining areas, for example, several pilot plantings have been established by making use of seeds that have been collected from natural forest or saplings (both of native and exotic species) raised at nurseries. Based on the results of this pioneering work, Suralco has been and is implementing further A/R. The development of these plantations is monitored by Suralco itself. There is no public domain information on how successful the efforts of the mining companies in Suriname have been or currently are at A/R. There is not just a need for A/R in relation to bauxite mining, but also in the industrial gold mining sector in Suriname; initial efforts at A/R have been done by IAMGold at their Gross-Rosebel operations.

5.3.6 Summary overview of REDD+ eligible activities

Table 8 below summarizes the main findings of the analysis of the REDD+ eligible activities, demonstrating the key areas where REDD+ can intervene in Suriname to maintain its HFLD status and continue to act a key net carbon sink (ROS 2015).

Table 8: Summary table of REDD+ eligible activities in Suriname

REDD+ eligible activity	Current status	Relevance for REDD+ in Suriname	Main barriers	Opportunities
Avoiding deforestation	Minimal impact (i.e. low deforestation rate), but potentially expanding significantly in future. Main past, current and future drivers: <ul style="list-style-type: none"> – Mining – Agriculture – Energy 	Addressing mining (main driver) will be crucial for REDD+ strategy, especially given the significant non-carbon (social and environmental) benefits that can be generated (Rahm et al. 2015).	High opportunity cost for addressing mining (to be confirmed by Task 2 in final report); significant influence of international gold price (Dezécache 2015), which is difficult to regulate through REDD+	Integrate REDD+ in NDC* and Vision 2035 to maintain HFLD status by, inter alia, reversing future plans to build roads in the Interior, expand large-scale agriculture production, and build new hydrodams.
Avoiding degradation	Impact of main known degradation drivers to be analyzed in detail for final report: <ul style="list-style-type: none"> – Forestry – Shifting cultivation with too short fallow cycles – Mining – Fires 	Addressing degradation caused by unsustainable logging considered to hold significant potential, esp. in community forests and HKVs**.	Law enforcement (CoP) difficult due to limited capacity with workers, weak internal governance of the communities, forest authority needs to be strengthened.	Significant areas of logging concessions currently under conventional logging with potential to shift to sustainable forest management. Agricultural practices can be improved. Increase timber recovery rate by increasing efficiency.
Conserving forest carbon stocks	13.5% of the country currently protected. The degree of enforcement is different, depending especially on whether the PA	Highly relevant due to Suriname’s HFLD status.	Potential to expand PA network in Greenstone belt extremely limited, despite high biodiversity in those areas.	South Suriname Conservation Corridor aims to establish 7 M ha PA to increase total PA area to 45%, thereby preserving much of

	area is located where mining potential is high, i.e. in the Greenstone belt.			Suriname's highly valuable pristine forest ecosystems in the south of the country.
Sustainable forest management	See "avoided deforestation above" 1.65 million under concession for logging	Highly relevant as 1.65 million ha are under concessional forest management	Adoption of unsustainable logging practices leading to forest degradation	Increase the area under sustainable forest management
Enhancing forest carbon stocks	Limited success and limited relevance for A/R or enrichment planning	Only relevant for mining areas	Limited success due to poor up-take of enrichment planting treatments	Reforestation of abandoned bauxite mines. Law to protect coastal plain.

Note: * NDC stands for Nationally Determined Contribution, which entails the translation of Suriname's INDC into an actionable plan to achieve the stated goals; **HKV are community forest titles that have been granted to village chiefs before the 1992 Forest Management Act. Both are under conventional logging, without pre-harvest planning such as logging compartments, roads, landings and skid trails.

5.3.7 Main barriers to REDD+

Many of the barriers identified are relevant for REDD+ as a whole in Suriname, rather than being specific to distinct REDD+ activities. This is also because the official UNFCCC definition of the five eligible activities are very general and these thus need to be defined in the specific context of Suriname in order to determine the specific barriers to these activities.²⁵ Therefore, this section includes a summary of the main barriers to REDD+ as a whole. This barriers analysis will be further elaborated in the final report, and feedback is therefore appreciated.

Legal framework providing enabling environment conditions

A number of sectors and institutions are struggling with the lack of the legal measures required to properly exercise their activities. For example, the LVV stated that the lack of a clear legal framework for agriculture development means that they are uncertain of the extent to where and how agriculture establishment can take place. In other words, there would be the need for legal forest protection measures to avoid the establishment of new agriculture fields in forest areas. Clear guidance on where and how new agriculture fields are established would be needed for REDD+ to ensure that agriculture is not established in forest areas.

In a similar note, the Investment and Development Corporation (IDCS) mentioned the fact that it is operating in a legal void, which means that it cannot properly exercise its institutional mandate to support sustainable investments. The most obvious example is NIMOS, which is meant to regulate and control environmental impacts, but is operating in a legislative environment that lacks mandatory environmental and social impact assessments (ESIAs). Only voluntary general guidelines for ESIAs and no legislation/regulations exist in relation to emission standards in the natural resource extraction industries (i.e. mining, agriculture, forestry).

²⁵ For example, the official UNFCCC definition of the forest conservation eligible activity has resulted in disagreement in international REDD+ debates about whether this definition is just a means to avoid deforestation and forest degradation, or if it also involves paying for maintaining forest stock. The main argument against stock payments is their low additionality; the counterarguments are fairness ("do not just pay the high polluters") and the potential for higher future deforestation in these places (Angelsen & Rudel 2013).

Intersectoral coordination

Suriname does not have an adequate and comprehensive land (use) policy in place. This makes it remains difficult to resolve the overlapping concession rights in an integrated manner and in a way that prioritizes REDD+ compatible investments. Certain institutions have mapped out areas relevant for different developments. For example, LVV received support from Brazil to conduct agriculture zoning and the Presidential Commission to Regulate the Gold Sector (OGS) has mapped out mining areas, SBB has concession maps. However, these initiatives are siloed and not based on a comprehensive analysis of different possible land uses or on environmental considerations. Land use planning – including the effective enforcement of land use plans – is considered fundamental to establish the enabling environment required for investments in REDD+. The lack of a land use planning policy may become a significant barrier to all REDD+ activities.

Financial and economic situation

Suriname has been hit hard by the drop in the international prices of its main export commodities, gold and oil, and the closure of the country's alumina production and structural overspending by the government. In 2011, revenues from the sale of the three commodities accounted for 88 percent of exports and 40 percent of government revenue. The subsequent price declines and the closure of alumina refinery Suralco in late-2015 have cut these revenues and caused substantial fiscal and external current account deficits. The fiscal deficit reached 8.8 percent of GDP in 2015 and consumer price inflation has reached 37 percent in March 2016 (IMF 2016). Surinamese authorities are therefore strongly engaged in restoring macroeconomic stability and confidence. This may distract attention from new initiatives such as REDD+. The proposed measures to economic recovery may hinder the national funds available for investments in REDD+. Further, the structural reforms proposed aim to attract foreign direct investment and diversify the economy (whether avoiding deforestation and forest degradation is a priority investment criteria is not clear). However, enhancing the productivity and competitiveness of Suriname's agricultural sector is of particular importance (ibid. 2016).

Clarity on indigenous and maroon land rights

The REDD+ process in Suriname was stalled early on partially because some of the first versions of the R-PP did not pay adequate attention to the rights of Indigenous and Tribal people. It will thus be critical to engage these stakeholders in a carefully planned and coordinated manner, ensure that they are well-informed and are given the opportunity to effectively influence the REDD+ strategy development process. Otherwise, there is a risk that Indigenous and Tribal groups may block the REDD+ process in a similar fashion to previous experience. As emphasized in the R-PP, specific attention must be given to translate the relevant information regarding REDD+ to Indigenous and Tribal groups in the Interior. Given that Suriname is also operating under the UN-REDD Programme, all steps of the REDD+ process will need to adhere to the principles and standards outlined in the UN-REDD Programme Guidelines on Free, Prior and Informed Consent (FPIC) (ROS 2013).

The tension between these groups and the government may become a barrier to REDD+ in the sense that experience from other forest countries in the Amazon suggests that an important challenge at the first stage of the forest transition curve is clarifying property (land tenure) rights in order to avoid land races, which occur when land is cleared with the primary purpose of establishing rights rather than for the productive use of the land (Alston, Libecap, and Mueller

2000). In many contexts, strengthening the rights of indigenous and tribal peoples can provide an effective buffer against commercial forest encroachment, but these rights need to be enforced by local political authorities.

Public awareness of REDD+

The general public of Suriname have insufficient awareness about REDD+, which is especially felt with the people who are living in the interior since they are strictly related with the forest. This is combined with a lack of awareness about the potential negative impacts of planned investments in mining, infrastructure and large-scale agriculture, on the environment and including on vulnerable groups, such as children, women, Indigenous and maroon tribes. This makes public participation with regards to development planning difficult to effectuate in a meaningful way. Further, policy makers also often demonstrate a lack of awareness when it comes to REDD+ and with the current economic situation as described above, it will be difficult to mobilize their full engagement in REDD+.

Biophysical and geographic- vulnerability to climate change

Although Suriname is categorized as an upper middle income country, it is recognized that Suriname shares the vulnerabilities of Small Island Developing States (SIDS) having a small population, the country's low lying coastline which makes it vulnerable to sea level rise, limited resources, susceptibility to natural disasters, high vulnerability to external shocks and excessive dependence on international trade (FAO 2015). The country is vulnerable to climatic disasters, particularly flooding resulting from sea level rise given the fact that most investments are made in the coastal area, which houses about 80% of the population. Although REDD+ activities can generate significant local and national economic benefits, including adaptation benefits in the form of ecosystem and community resilience building, other climate adaptation measures may take priority.

5.4 Concluding remarks

As a HFLD country, Suriname's central challenge with regard to REDD+ will be to minimize emissions of forest carbon stocks. Thus a first set of policy recommendations would be to carefully plan against actions and public and private investments that would trigger a process of accelerating deforestation. In order to maintain its HFLD status, Suriname will need to avoid, or very carefully plan, building roads, establishing large resettlements or agro-export schemes, or supporting commercial projects (e.g. mining) with accompanying infrastructure and energy supplies through hydrodams. Careful consideration of the construction of publicly funded penetration roads is extremely important in this context because, once completed, they spur the construction of privately funded roads by small-scale miners or investors in agricultural enterprises. Some of these projects may still be pursued for purposes of income generation, but they should be undertaken only when careful Strategic Impact Assessments accompany the projects and the appropriate environmental countermeasures are taken (van Dijck 2010). However, in the lack of

any legally binding impact assessment standards²⁶, extreme caution should be taken when considering how REDD+ can be integrated into current and future development plans.

In terms of next steps, we will appreciate feedback on the approach outlined in this report as well as the preliminary analysis for Task 1. Especially critical will be improving the barrier analysis and how this should be structured for the final report. In the meantime, the work on Tasks 2-4 is continuing with regular interaction between SBB, NIMOS, the PMU, and other key stakeholders, including the technical backstopping provided by UNDP. This regular communication helps to ensure smooth implementation of the assignment in a way that ensures it can provide the most valuable information for development of the future REDD+ strategy. At the same time, the training and information sharing to national stakeholders will continue so that the study can simultaneously provide a key opportunity for capacity and consensus building.

²⁶ Although there are no legally binding assessment standards, there are conditions that must be fulfilled when licences are granted, especially for large-scale infrastructure construction.

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7 ANNEXES

7.1 Annex 1: Inception mission schedule

Monday 5 September

Arrival and internal consultant team meeting

Tuesday 6 September

Full day of meetings in the SBB Office

Address: Martin Luther Kingweg 283 (Highway), Paramaribo

09:00-12:00 - Inception meeting between client and consultant - discussion of mission schedule, work plan for the full assignment, etc.

Participants:

Consultants: Sophia Carodenuto, Jochen Statz, Karin Lachmising, Rachelle Bong A Jan

SBB: Hesdy Esajas, Rene Somopawiro, Sara Svensson, Priscilla Miranda

NIMOS: Madhawi Ramdin, Marlon Hoogdorp, Santusha Mahabier

14:00-16:00 - Kick-off meeting with governmental stakeholders (see Annex 2 for details on participants, agenda and minutes)

Wednesday 7 September

9:00 Prof. Paul Ouboter, UVS / NZCS

10:30 Team of researchers at NARENA/CELOS

Virginia Wortel (researcher biodiversity)

Virginia Atnopawiro (Remote Sensing expert)

Ansmarie Soetosenojo (Head of Chemical lab)

Ngu Chin Tjon

Sharona Jurgen (Head of NARENA GIS & RS)

Maureen Playfair

11:15 Rudi van Kantén, Cheryl Sastro, Tropenbos International Suriname. Attended by SC, JS, KL, RB

Thursday 8 September

Field visit to gold mining sites in Koffiekamp (insight IAMGold concession)

Friday 9 September

09:00: Agro cooperative Wi! Uma Fu Sranan

11:00: Internal meeting with sector experts to discuss Task 2

13:00: NIMOS

16:00-17:00 UNDP Mr. Armstrong Alexis

Saturday 10 September

10:00 Meeting with FSC companies

Wedika Hanoeman, Roy Hilgerink (Greenheart Group)

Benito Chin Ten Fung (Caribbean Parquet Flooring NV)

Satin Soekhoe (Soekhoe & Sons NV)

Sunday 11 September

Internal consultants meeting

Monday 12 September

Public holiday in Suriname

10:00 Internal consultants meeting with Attune experts to discuss Task 4

16:00 Meeting with SBB REDD+ team

<u>Tuesday 13 September</u>			
<p><i>Meeting with SBB Forest Cover Monitoring Unit (FCMU) to discuss Task 3</i></p> <p>Address: SBB Office, Martin Luther Kingweg 283 (Highway), Paramaribo</p> <p>Participants: Prashant Kadgi, Sophia</p> <p>8:00-17:00</p>	<p><i>Meetings with civil society to discuss Task 4</i></p> <p>Address: NIMOS meeting room, Jaggernath Lachmonstraat 100</p> <p>Participants: Karin Lachmising, Rachelle A Bong, others?</p> <p>8:30-10:30 - Suriname Conservation Foundation (SCF), Amazon Conservation Team (ACT),</p> <p>11:00-13:00 - Organization of Indigenous People in Suriname (OIS), Indigenous Platform ESAV,</p> <p>13:30-15:30 Conservation International (CI), Green Heritage Fund Suriname (GHFS)</p>	<p><i>Bilateral meetings scheduled by Sophia:</i></p> <p>09:00 - IDCS NV Address: Brokopondolaan 97 Attendance: SC, JW, SS, MR</p> <p>10:30-11:30 Netherlands Embassy, Van Rosevelt-kade</p> <p>12:00 Ministry of Agriculture (LVV), SAIS building</p> <p>14:00 ALCOA</p> <p>16:00 - IAMGOLD Address: Siriusstraat 14 , SC/KL /RB</p>	<p>09:00 - Planburo (Celine, Priscilla Miranda)</p>

<u>Wednesday 14 September</u>		
<p><i>Meeting with SBB Forest Cover Monitoring Unit (FCMU) to discuss Task 3</i></p> <p>Address: SBB Office, Martin Luther Kingweg 283 (Highway), Paramaribo</p> <p>Participants: Prashant Kadgi, others?</p>	<p><i>Meetings with civil society to discuss Task 4</i></p> <p>Address: NIMOS meeting room, Jaggernath Lachmonstraat 100</p> <p>Participants: Karin Lachmising, Rachelle Bong A Jan, others?</p> <p>08:00 Marlon</p>	<p><i>Bilateral meetings Sophia:</i></p> <p>09:00 VSB Vereniging Surinaams Bedrijfsleven = Suriname Trade & Industry Association</p>

<p>8:00-17:00</p>	<p>8:30-10:30 Sabi yu gaandi, 12-Lo Okanisi, E Poetisi</p> <p>15:00-16:00 Association of Indigenous Village Leaders (VIDS) (Skype call)</p>	<p>11:00 WWF & ACT in WWF office, Henck Arronstraat</p> <p>14:00 NIMOS environmental impact assessments</p>
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<p><u>Thursday 15 September</u></p> <p><i>Meeting with SBB Forest Cover Monitoring Unit (FCMU) to discuss Task 3</i></p> <p>Address: SBB Office, Martin Luther Kingweg 283 (Highway), Paramaribo</p>	<p>10:30 - 12:00 <i>Wrap-up meeting with client, including summary of mission and next steps</i></p> <p>Address: SBB Office, Martin Luther Kingweg 283 (Highway), Paramaribo</p>	<p><i>Meetings with civil society to discuss Task 4</i></p> <p>8.30-10.30 – Association of Saraccan Authorities (VSG) and representatives of all other maroon tribes- to be confirmed</p>
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7.2 Annex 2: Minutes from DDFDB+ Study inception meeting between clients and consultant team

SBB meeting room, 6 September 2016, 09:00-12:00

Participants:

René SOMAPAWIRO

Sara SVENSSON

Priscilla MIRANDA, SBB Dept of Research and Development
Repr. Dept. of Planning

Santusha Mahabier-REDD+ Assistant, NIMOS

Marlon Hoogdorp-REDD+ Communication Officer, NIMOS

Madhawi RAMDIN, REDD+ Project Coordinator, NIMOS

Clarence Sairras, National Planning Office

Four representatives from Forest Cover Monitoring Unit (FMU), SBB

Rachelle BONG A JAN, Attune Team/UNIQUE

Karin LACHMISING, Attune Team/UNIQUE

Jochen STATZ, UNIQUE

Sophia CARODENUTO, UNIQUE

Welcome and introduction of participants

Adoption of meeting agenda

UNIQUE's approach to implementation of the DDFDB+ study

Planned stakeholder engagement and approach to each sub-task

Presentation by JSt

Questions regarding the experiences from R-PP preparation back in 2012 and the expected challenges

Presentation by SCa; comments from participants:

Discussion following the presentation: don't limit the study to mining, forestry and agriculture as drivers of DD (René); planned vs. unplanned DD (SCa), much of infrastructure development (urban expansion, roads) is in fact unplanned, although it shouldn't (Priscilla), there is no comprehensive land use plan, only sectoral plans (Ms. Ramdin, NIMOS)

Concept of the drivers' analysis: Underlying causes, Agents, Proximate drivers

Combination of quantitative and qualitative assessment

Three dimensions of looking at drivers: ha of DD, carbon reduction benefits, economic importance

Qualitative analysis of drivers; explaining *why* stakeholders act the way they do, increasing validity through opp. cost analysis

Task 5: comprehensive reporting and national level validation

Spatial analysis to ideally precede the quantitative and qualitative analysis, but we need to remain flexible; we also want to value what already exists

At the time of R-PP preparation Attune had prepared a specific format to document expectations and concerns of local communities and to structure the engagement of local communities (hint by NIMOS, the document has been formatted)

Karin underlines the importance of having a common understanding and commitment to stick to the deadlines

For the workshop of REDD+ Assistants: no travel costs and daily allowances will be paid for the participation of the REDD+ Assistants; this needs to be discussed again between SBB and NIMOS and will be communicated with the rest of the group by 16 Sept

Selection of communities for the selection of the three pilots to be done involving consultants and SBB/NIMOS

Stakeholder analysis by NIMOS has started and is ongoing; 2-3 more weeks are required before findings of the interviews will be available; when working with communities it is very challenging to respect the by deadlines

Final/validation workshop: consultants cover costs for venue and food/drinks, but not to bring participants to the workshop (i.e, no travel costs or allowances paid by UNIQUE as per the standard policy)

Reporting of what has been done in the first month of the consultancy

Process: internal working structure and involvement of consortium members

Substance: review of draft results planned to be discussed with stakeholders

Any difficulties/challenges encountered so far?

No additional deliverables (like an intermediate report) should be expected from the consultants, but continuous sharing of information on the various activities it is proposed to nominate contact persons in SBB/NIMOS for each Task, especially Task 2

Review of schedule and objectives for the first mission

Mission objectives and expected content of inception report

Planned meetings

The overall timeline is ambitious, especially for Task 4 (René), if the full information is not available and the deliverable cannot be submitted as per this timeline, we need at least preliminary outputs that will inform the overall study

Most meetings are scheduled, an overview has been shared with Sara

What is the logic behind including 'other donor institutions' ("tertiary stakeholders") in the list; Madhawi Ramdin wants to join the consultants when visiting some of these donors (so far, only, Alexis, UNDP, and the Netherlands Embassy); likewise, SBB wants to join the meetings

during the inception mission, Sara is going to available throughout and possibly other SBB experts, too

Work Plan: October is realistic to have the REDD+ Assistants' inception workshop, but the consultants should also do a contingent planning that does not rely on the timely involvement of the REDD+ Assistants (says NIMOS); selection of target communities can only been done following a stakeholder analysis, however, delays in the implementation of this process should not delay the implementation of the rest of the drivers study,

Streamlining calendars and seeking synergies for implementation of the DDFDB+ study

SBB calendar for the rest of the year

Has been shared by Sara with the consultants

NIMOS/PMU calendar for the rest of the year (including REDD+ Assistants)

UNIQUE's planned calendar and timing of scheduled deliverables

Administrative issues

Contract with signature on all pages

Prashant tries to bring the duly signed contract documents when rejoining the team at the end of this week

Status of payment

The first payment has been received by UNIQUE

Communication and reporting structure

7.3 Annex 3: Minutes from presentation and discussion on preliminary findings of Task 1

National Planning Office: Preparation of the *Meerjaren Ontwikkelingsprogramma 2017-2021*. Plan is under preparation, a final draft can be expected to be ready by 15 Sept 2016, it will be submitted to the National Assembly (Parliament) by the President. It is expected to be enacted before the end of the year. and will then be shared with the State Council and launched before the end of the year

In parallel, the annual planning for 2017 is being prepared (including sector wise budgets); there will be a special section on regional and sectoral planning and a town development plan

There will also be a specific chapter on forests and timber sector prepared with the support of SBB in cooperation with the timber industry; it states the overall productive potential of the forests; besides that there are two existing forest policy papers, which have been taken into account when preparing the forest chapter

Sophia: it would be good to get the contact details of persons in charge of the chapters covering the various sectors potentially contributing to DD

Would be interesting to establish a link with the upcoming UNDP CC Adaptation project (contact through Sara of SBB)

Cabinet of the President prepared an (I)NDC in 2015, renewable energy (solar panels, hydroelectricity) as a possible source of meeting the set targets

Cadaster sees itself as a 'passive stakeholder' in the land use and drivers debate, as they can only reflect what happens on the ground; digitization of cadastral data has been done mainly for urban areas, for forest areas it's primarily SBB who prepares maps; the Cadaster has also historical data that could be used to establish time series, but this type of analysis has not yet been done

There is no overall land use plan, but there are district and resort (sector) plans and regional/sectoral visions, but no comprehensive plan

Brazil is offering to update the geological map of Suriname

Zoning of the country based on geological and soil types is being considered

EMBRAPA funds an Agricultural and Ecological Zoning exercise

Sophia: What development in the country is likely to cause the most impact of the country's forest?

Mining will have the biggest impact

Most accessible land is privately owned/controlled; these land owners might convert their land and engage in all types of activities, which are difficult to predict; all is very speculative

Huge potential: to increase the capacities of local communities to manage their forests commercially

Also with high potential: certification; but as a more obvious step one should start by enforcing the existing legislation

HFLD status of Suriname is due to the abundance of natural resources available near the coast, as a result there is no need to plunder the interior; also the available technologies did not allow to open up the interior for agriculture;

100,000 to 200,000 ha of palm oil plantations might be implemented in the near future

Current capacity of 320 megawatt is not enough, there is a gap/deficit of 500 megawatt that will require a substantial increase of the energy production

Hydrodams are now being considered in the West of the country, a Norwegian consultant has been asked to reassess earlier plans that had been put on hold

Dryland rice is cultivated in the Brokopondo area with technical assistance provided by EM-BRAPA

Kaplan Planners Ltd. consulting of Israel has prepared an agriculture masterplan together with the Investment & Development Corporation Suriname NV (IDCS); the plan has been commissioned by LW, the “Ministerie van Landbouw Veeteelt en Visserij”

IDB and EU plan to develop the agriculture sector, the planning for this is about to start 240,000 ha of shifting cultivation, but the total area seems to be stable, one of the strategic options also mentioned in the R-PP is to reduce the rotation cycle of the shifting cultivation
Impacts of gold mining: esp. larger scale gold mining will continue to have a strong impact, but it is under better control than the informal small scale mining and generally complying with international social and environmental safeguards

Uncertainty about overlaps between different types of concession systems (e.g. forest concessions overlapping agri concessions and gold mining)

Mining is an activity that legally doesn't have precedence over other sectors, but tends to be given more attention to access rights

Destruction of forest is easier than commercially logging them

It is not possible to combine gold mining and timber extraction (preceding the gold exploitation)

Zoning is important, confining mining to clearly designated areas and to do a maximum possible to rehabilitate abandoned mines

Communities have been given licenses to manage the forest under CF, but the way it is being implemented it acts as a driver of deforestation; the captains sign agreements with logging companies to use these rights; it should be the communities who implement CF and share the benefits for their communal development;

Community leaders are not sufficiently equipped to handle this type of situation, esp. REDD+ is not an easy topic to understand in a society that is not only based on money, but also strongly governed by traditions and customary rights; the money involved in (illicit) forest utilization that can be earned by the captains is huge

A huge challenge and big expectations as to what REDD+ can achieve

REDD+ provides grievance mechanisms – this is a huge benefit that can be felt already

The consultants need to see the Ministry of Natural Resources (in charge of mining),

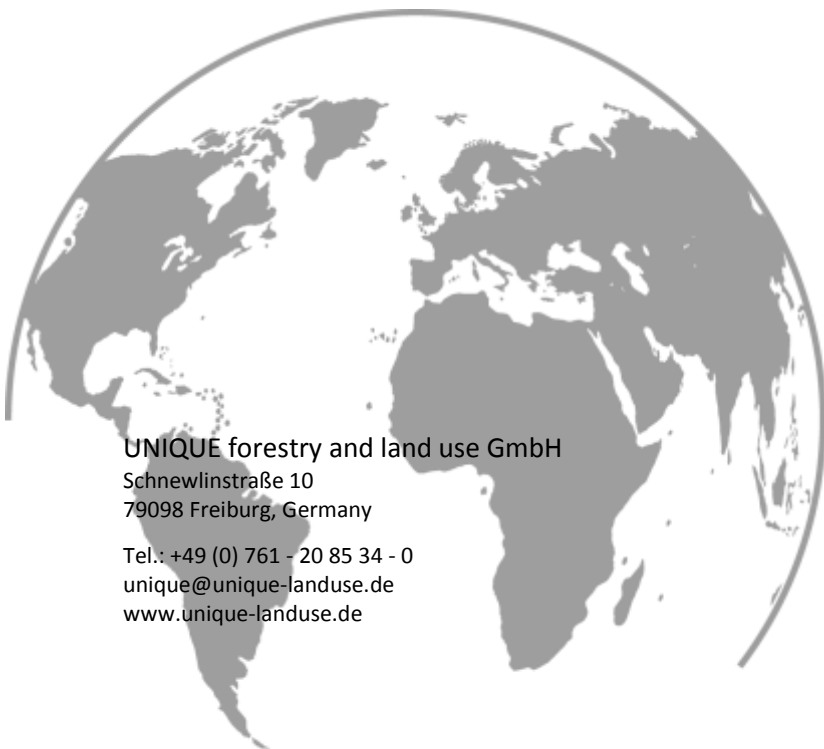
7.4 Annex 4: Overview of the quick land use assessment in relation to drivers of deforestation and forest degradation (RPP, 2013)

Potential driver	Relevant national program or strategy	Conditions that might trigger or accelerate the DFD process	Existing regulations	Gaps and constraints
MINING	<ul style="list-style-type: none"> ☐ Suriname's Development Plan 2012 - 2016 ☐ Commission of the Structuring of the Gold sector (OGS) ☐ The Brokopondo Agreement ☐ Mining Decree ☐ Ministry of National Resources ☐ Permanent Parliamentary Oversight Commission on Natural Resources ☐ Environmental and Social Guidelines by NIMOS 	<ul style="list-style-type: none"> ☐ Increasing gold prices ☐ Low taxes on gold, stimulating migration from Guiana ☐ Weak monitoring and enforcement of mining and other related regulations ☐ Limited options for livelihoods for forest dependent communities ☐ Potential mining of other resources ☐ Increased accessibility of the interior e.g. due to road building ☐ Development and accessibility to specialized mining methods 	<ul style="list-style-type: none"> ☐ The Mining Decree ☐ The Brokopondo Agreement 	<ul style="list-style-type: none"> ☐ Lack of integrated concession policy ☐ Lack of/ insufficient control (illegal mining, illegal immigration, health and safety issues etc.) ☐ Lack of research on alternative, sustainable livelihoods for forest dependent communities ☐ Lack of legislation for enforcing ESIA ☐ Lack of Environmental Act ☐ Capacity for implementation of sustainable small-scale mining methods ☐ Costs for monitoring and research ☐ Legal asymmetry among neighboring countries
LOGGING	<ul style="list-style-type: none"> ☐ Suriname's Development Plan 2012 - 2016 ☐ Ministry of Physical Planning, Land 	<ul style="list-style-type: none"> ☐ Increasing demand for tropical timber due to population growth and urbanization world wide 	<ul style="list-style-type: none"> ☐ Forest Management Act ☐ National Forest Policy ☐ Nature Conservation Act 	<ul style="list-style-type: none"> ☐ Institutional capacity strengthening (monitoring, training, outreach)

	<ul style="list-style-type: none"> and Forestry Management ☐ Foundation for Forest Management and Forest Control ☐ Nature Conservation Division ☐ Forest Management Act ☐ National Forest Policy ☐ Interim Strategic Action Plan for the Forest Sector ☐ National Forest Policy ☐ Environmental and Social Guidelines by NIMOS ☐ The National Biodiversity Strategy 	<ul style="list-style-type: none"> ☐ Low concession fees ☐ Low taxes on timber export ☐ Weak law enforcement ☐ Weak SFM protocols and criteria ☐ Development and accessibility to specialized logging methods ☐ Increased accessibility of the interior due to road building ☐ Higher prices due to development of the REDD+ mechanism, leading to more lucrative harvesting in remote areas 	<ul style="list-style-type: none"> ☐ Game Act ☐ National Biodiversity Strategy 	<ul style="list-style-type: none"> ☐ Lack of /insufficient control (illegal logging, illegal immigration, health and safety issues etc.) ☐ Lack of research capacity and funding ☐ Lack of legislation for enforcing ESIA ☐ Lack of Environmental Act ☐ No baseline studies ☐ Incoherent land use map ☐ Costs for monitoring and research ☐ Improvement of current lumber laws is needed ☐ Commercially oriented concession promoted ☐ Lack of information on the application of existing SFM protocols and criteria
AGRICULTURE	<ul style="list-style-type: none"> ☐ Suriname's Development Plan 2012 - 2016 ☐ Ministry of Agriculture, Animal Husbandry and Fishery ☐ Ministry of Physical Planning, Land and Forest Management 	<ul style="list-style-type: none"> ☐ Government approval for starting-up palm oil plantations and others. ☐ Increasing prices for agricultural products ☐ Global population growth ☐ Easily accessible and abundantly available arable land 	<ul style="list-style-type: none"> ☐ Export Act regarding Agriculture and Forest products ☐ Nature Conservation Act ☐ Agricultural Act 	<ul style="list-style-type: none"> ☐ Costs for monitoring and research ☐ Lack of legislation for enforcing ESIA ☐ Lack of Environmental Act

	<ul style="list-style-type: none"> ☐ The National entity for development of the rice sector ☐ The National entity for development of the cassava sector ☐ Environmental and Social Guidelines prescribed by NIMOS 	<ul style="list-style-type: none"> ☐ Sectoral focus of Government to increase commercial agricultural products ☐ Limited options for livelihood for forest dependent communities ☐ Regional integration into CARICOM ☐ Weak monitoring and enforcement of chemical use ☐ Lack of spatial planning ☐ Worldwide restrictions on gluten, leading to increased demand for alternatives (e.g. cassava) 		
ENERGY	<ul style="list-style-type: none"> ☐ Suriname's Development Plan 2012 - 2016 ☐ The Ministry of Natural Resources ☐ National energy company (Energie Bedrijven Suriname N.V.) ☐ National oil company (Staatsolie N.V.) ☐ Local large energy producer (Suralco N.V.) ☐ The Brokopondo Agreement 	<ul style="list-style-type: none"> ☐ Construction of gold refinery ☐ Expansion of IAMGOLD mining operations ☐ Construction and operationalizing of NEWMONT mining operations ☐ Government housing development ☐ Expansion of State Oil refinery ☐ Historical organic growth ☐ Potential for biofuels and increased hydro energy 		<ul style="list-style-type: none"> ☐ Costs for monitoring and research ☐ Lack of legislation for enforcing ESIA ☐ Lack of Environmental Act

INFRASTRUCTURE	<ul style="list-style-type: none"> ☒ Suriname's Development Plan 2012 - 2016 ☒ Ministry of Public Works ☒ Ministry of Regional Development ☒ Regional and National Infrastructural Program 	<ul style="list-style-type: none"> ☒ Increased demand for roads ☒ Creation of supporting infrastructure for power generation projects ☒ Increased supporting infrastructure in the interior ☒ Lack of spatial planning policy ☒ Increased regional integration and trade development ☒ Increased housing construction projects (public grand private sector) 	<ul style="list-style-type: none"> ☒ Regional Development Act ☒ Urban Development Act ☒ Architecture Act ☒ Road Authority Act ☒ Planning Act 	<ul style="list-style-type: none"> ☒ ESIA is not mandatory ☒ Monitoring costs ☒ Research costs ☒ Lack of research capacity and funding ☒ Draft Environmental Act
HOUSING	<ul style="list-style-type: none"> • Suriname's Development Plan 2012 - 2016 • The housing authority • Ministry of Social Affairs and Housing • Housing Program 2012-2017 (Huisvestingsplan 2012-2017) • Suriname building code • Department of Planning of the Ministry of Finance 	<ul style="list-style-type: none"> ☒ Population growth ☒ Current lack of housing ☒ Immigration from neighboring countries ☒ Migration from rural areas to urban centers ☒ Poor land use planning 		<ul style="list-style-type: none"> ☒ Lack of spatial planning and zoning policies



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