Preparing Guyana's REDD+ participation: Developing capacities for monitoring, reporting and verification

Report and summary of a workshop and consultation held

27. – 29. October 2009

in Georgetown, Guyana

Prepared by

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for

The Government of Norway

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Executive Summary

The Government of Guyana and Norway are jointly preparing a program designed to assist Guyana to prepare for and take advantage of carbon and climate related finance for sustainable management in the forest sector and for natural resources, enabling the protection and enhancement of resilient forested landscapes and to, overall, support of a national low carbon development strategy. The activities include the development of capacities for monitoring, reporting and verification (MRV) of forest carbon stocks and changes.

In this context, the overall goal of the activities reported here are to develop a road map for the establishment of a MRV system for REDD+ participation for Guyana. A workshop of 90 national experts and stakeholders, and a series of consultations with relevant agencies were conducted during 27-29. October 2009 in efforts to prepare Guyana's participation in REDD+ mechanisms. The workshop and the consultations produced significant progress to provide the foundations for developing the capacities for a REDD MRV system for Guyana. The following progress has been achieved:

- MRV capacity gap assessment for national requirements (forest change processes/drivers) and International requirements (IPCC GPG LULUCF requirements)
- Develop of a MRV roadmap to build sustained in-country capacities based on current understanding and emphasizing the national REDD implementation opportunities
- Specification for a number of key activities that should be tackled in the near term, including the work on terms of reference to soon start activities while maintaining flexibility to speed up things if desired by Guyana

The outcomes have resulted in the definition of a MRV capacity development roadmap that follows a set of general requirements and principles:

- The overall goal is a capacity development process to establish sustained MRV for implementing REDD policies and results-based compensation for such activities in the long-term as contribution to Guyana's low carbon development pathway and support for the sustainable development of natural resources;
- The development of a national REDD+ MRV system uses a phased approach along a roadmap that specifies near-term priorities & long-term targets, builds upon existing capacities and data, and international requirements and national needs, and has the objective to support annual estimation, reporting and verification of forest-related carbon emissions and removals on the national level,
- The MRV system evolution is directly linked with REDD+ policy development and implementation and contains a systematic national monitoring, reporting and verification system and a sub-national program to support MRV for local REDD+ activities;
- A strong institutional set up and the establishment and maintenance of partnership and cooperation on all levels as enabling framework.

Seven specific areas were identified where activities are recommended for the first phase and should start as soon as possible:

- Develop and implement a national mechanism and institutional framework
- Implement a comprehensive forest area change assessment for historical period
- Build carbon stock measurement and monitoring capacities
- Develop MRV for a set of sub-national REDD demonstration activities
- Engagement with the international community
- Sustain an internal and national communication mechanisms
- Conduct and support research on key issues

Table of Content

Acronyms

AFOLU	Agriculture, forestry and other land uses
CIFOR	Center for International Forest Research
FAO	United Nations Food and Agriculture Organization
FCPF	Forest Carbon Partnership Facility of the World Bank
GEO	Group of Earth Observation
GHG	Greenhouse gas
GOFC-GOLD	Global Observations of Forest and Land Cover Dynamics
GPG	Good Practice Guidance
INPE	National Institute for Space Research (Brazil)
IPCC	Intergovernmental Panel on Climate Change
LULUCF	Land Use, Land Use Change and Forestry
MRV	Measurement, Reporting and Verification
NGO	Non-Governmental Organization
REDD	Reducing Emissions from Deforestation and Forest Degradation
SBSTA	Subsidiary Body of Science and Technical Advice
ToR	Terms of Reference
UNFCCC	United Nations Framework Convention on Climate Change

1 Background and objectives

A workshop of experts and stakeholders, and a series of consultations with relevant agencies were conducted during 27-29. October 2009 in efforts to prepare Guyana's participation in REDD+ mechanisms. The activities are embedded in efforts by the Government of Guyana that aims to embark on a low carbon economy path that includes the protecting and maintenance of its forests in an effort to reduce global carbon emissions. Guyana has over 80% of its land area covered by forests, approximately 16 million hectares. Based on current information and understanding, there has been relatively low deforestation rate in Guyana estimated at 0.1% to 0.3% per annum.

The cooperation between the Governments of Norway and Guyana expresses a willingness to work together to provide the world with a relevant, replicable model for how REDD-plus can align the development objectives of forest countries with the world's need to combat climate change The initiative will require the development of capacities for monitoring, reporting and verification (MRV) of forest carbon stocks and changes. In this context, the overall goal of the activities reported here are to develop a road map for the development of a MRV system for REDD+ participation for Guyana. The development of such road map considered several aspects that have been elaborated in the facilitation process and for developing terms of reference for developing an REDD MRV system:

1. Requirements for the MRV system:
    - The accepted principles and procedures of estimation and reporting of carbon emissions and removals at the national level should meet criteria specified by the IPCC Good Practice Guidelines and Guidance for reporting on the international level;
    - The particulars of the national REDD implementation strategy that has been selected, since different activities have different MRV implications;

2. Bridging the capacity gap through a detailed plan to establish sustained MRV capacities within the country:
    - Capacity gap assessment based on the state of the existing national forest monitoring technical capabilities and the requirements for the MRV system;
    - Develop a road map and its implementation through a sustained and efficient institutional framework including competence in measuring and monitoring at different levels, support of national policies and REDD+ actions, international reporting and verification, and linking MRV of actions and MRV of transactions.

The facilitation process was be lead by Martin Herold through a national three day set of workshops and meetings and provide to Guyanain the form of training, moderating discussions, assessment of existing capacities and synthesizing the results for the ToR development.

There were a specific work and discussion items that have been presented and discussed during the 3 days facilitation:

1. Summary of Guyana's national REDD+ process
2. Training/introduction of IPCC Good Practice Guidelines on LULUCF
3. Assessment of current data and capacities in Guyana
4. Assessment of current and future drivers of forest carbon change and current monitoring activities
5. Capacity gap assessment considering both international and national requirements
6. Development of road map for building a sustained MRV system within the country as basis for developing the MRV terms of reference
7. Synthesis presentation and discussion in plenary
8. Writing session to support the development of the MRV ToR for Guyana

The following sets of documents have been made available (digitally) for or after the workshop:

1. UNFCCC/SBSTA technical paper on costs of monitoring for REDD published in June 2009 (printed copies should be distributed at the workshop): http://unfccc.int/resource/docs/2009/tp/01.pdf
2. GOFC-GOLD REDD technical sourcebook, updated version published in July 2009 (3-4 printed should be available to key technical people): http://www.gofc-gold.uni-jena.de/redd/sourcebook/Sourcebook_Version_July_2009_cop14-2.pdf
3. UNFCCC SBSTA 30 decision and draft text for Copenhagen negotiated in June 2009 (should be available to workshop participants): http://unfccc.int/resource/docs/2009/sbsta/eng/l09.pdf
4. An assessment of national forest monitoring capabilities in tropical non-Annex I countries: http://princes.3cdn.net/8453c17981d0ae3cc8_q0m6vsqxd.pdf
5. Draft chapter on "MRV and REDD+ policy: objectives, capacities, institutions" by M.Herold and M. Skutsch (available as pdf)

The technical experts participating in the workshop were encouraged to consider the recent guidelines and guidance

- Guidelines (2003) on Land Use Land Use Change and Forestry (LULUCF), focus on chapters 2 and 3:
  - http://www.ipcc-nggip.iges.or.jp/public/gpglulucf/gpglulucf.html
- Guidance on Agriculture Forestry and other Land Uses (AFOLU), focus on chapters 1-4:
  - http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol4.html

2 Workshop participants

A 2 day workshop held 27. and 28. October 2009 at the Pegasus Hotel in Georgetown/Guyana was jointly organized by the Guyana Forestry Commission and Martin Herold. The workshop brought together 90 participants including high-level politicians, Guyana's Office of Climate Change, key governmental agencies, national monitoring experts, international donor organizations, representatives from local and indigenous communities (National Toshoa's Council) and national and international NGO's. The full participants list is provided in Appendix A.

3 Workshop agenda

The workshop had duration of 2 full days. Appendix B provides the detailed agenda. The first day included a high-level opening and presentation by national and international experts on REDD MRV and policy. The afternoon was dedicated to plenary discussion on key MRV topics and capacity needs. The second day morning was mainly dedicated breakout group discussions in three areas:

1. Data and capacity gap assessment and scoping of next activities: The aim of the group was to bring together technical experts to discuss IPCC requirements, national forest processes, and related capacity gaps and discuss a set of next steps and actions (see summary Appendix C)
2. Drivers and processes of forest carbon change: The group discussed drivers and processes active in Guyana and scoped policy REDD opportunities and MRV implications in terms of existing gaps and next steps (see summary Appendix D)
3. Community participation: This group discussed the role and opportunities of local actors in REDD and MRV and defined capacity development needs and next steps (see summary Appendix E)

The results of the group discussed was summarized and synthesized and resulted in the development of the roadmap for MRV capacity in plenary.

With permission of the speakers, all presentations of the workshop are available as ADOBE PDF on the website of the Guyana: www.forestry.gov.gy.

4 Summary of workshop presentation and discussions

4.1 Policy background

While policy and compensations mechanisms for implementing REDD are still under discussion by the UNFCCC, the draft text on methodology for REDD produced by SBSTA 30 in June 2009 makes it clear that not only reduced emissions from deforestation and degradation, but also forest conservation, sustainable forest management and forest enhancement are likely to be included in the agreement which will be finalized at the climate summit in Copenhagen in December 2009. These three elements are usually jointly referred to as 'REDD +'.

This creates some certainty about the contours of the agreement and what will be credited, as well as opportunities to use a variety of approaches to measuring and monitoring. One key measure to quantify the role of a forest for climate change mitigation is the sum of the carbon stored in its terrestrial pools (i.e. vegetation biomass and soil carbon). It can be assumed that any change in the forest carbon stocks from direct or indirect human activities has an impact on the climate with the overall goal to reduce the amount of emissions to the atmosphere and to maintain or increase the overall terrestrial carbon pool. Thus, climate change mitigation activities currently under discussion encourage:

- the long-term conservation of forests to maintain its current or natural carbon reservoir,
- to change the impact of human activities (i.e. causing carbon emissions from land use) in forests to stabilize or increase terrestrial carbon stocks in the long-term,
- a change in current human activities towards reforestation of land to increase the terrestrial carbon sink.

These generic and fundamental objectives are addressed in the REDD+ and the LULUCF discussions in a number of concepts, such as deforestation, forest degradation, forest conservation etc. These reflect the need to specify policies to alter human activities towards a more climate friendly way, means to measure and report their carbon impact on the local, national and global level, and the link between the two. Since current REDD+ discussions are dealing with both cause-oriented and emission-oriented approaches, dealing with these concepts becomes even more critical and sensitive.

It is currently not practical nor efficient to measure and report the stocks and changes for the global terrestrial carbon reservoir with the level of detail and certainty to address all drivers and processes that have a carbon impact on the land. REDD+ readiness activities are encouraged to start right away and will need to include a priority setting given that

- Countries start from a diverse set of backgrounds in terms of historical drivers and changes in forest carbon; expected future land use changes due to their development objectives; and current capabilities for measuring and monitoring forest carbon on the national and local level. The current primary aim should be how the three objectives noted above can be addressed given that:

- current human land use impacts causing carbon emissions are focused in specific areas and regions and should, perhaps, be primarily addressed in the very near-term; however, it is the long-term stabilization or increase of the terrestrial carbon reservoir as a whole that will decide on the effectiveness of the activities initiated today,
- resources to address REDD+ will be limited and not suitable to address all issues everywhere at the same time. While all countries should be encouraged to participate from the beginning, their entry points will vary and priority setting and efficient implementation strategies will be needed at the international, national and sub-national levels.

Thus, we should understand the use of concepts like deforestation, degradation and conservation as means to provide agreed international frameworks and to scope and define practical and efficient implementation strategies (policies and MRV) for countries and actors to start REDD+ actions. This should include the definition of long-term targets and the specification of near-term priorities. For example, in the case of national monitoring, it is not practical to measure each ton of carbon or each tree individually on a regular basis. However, it is possible and efficient to achieve some level of national monitoring with most detail and certainty in spatially limited areas of "REDD actions" that proves and verifies the positive effect of policies and implementation for the climate.

4.2 Principles for MRV capacity development for Guyana

The current UNFCCC SBSTA negotiation text (June 2009[1]) refers to the need to establish monitoring systems that use an appropriate combination of remote sensing and ground-based forest carbon inventory approaches with a focus on estimating anthropogenic forest-related greenhouse gas emissions by sources, removals by sinks, forest carbon stocks and forest area changes. It is agreed that the IPCC Good Practice Guidelines on Land Use Land Use Change and Forestry (LULUCF) provide suitable and agreed methods and procedures to estimate and report on carbon stock changes for deforestation, forest degradation, forest conservation, reforestation, afforestation etc. All MRV activities and estimates should follow the five IPCC reporting principles and should particularly be transparent, comparable, consistent, as accurate and complete as possible, and should reduce uncertainties, as far as national capabilities and capacities permit). It is further indicated that these monitoring systems and their results will be open to independent review as agreed by the Conference of the Parties.

Table 1 lists some of the key information sources currently available to Guyana as international guidance. In that context, the UN REDD program has specified a set of key considerations for development of national MRV systems:

1 – Monitor What Matters
2 – Warrant Multi-stakeholder process
3 – Ensure Quality, Reporting and Verification compliance
4 – Guarantee Availability and Accessibility of data and Methods
5 – Support Investment and Sharing of Benefits
6 – Strengthen Institutional, Technical, Legal and Policy Development Capacities

These considerations clearly point at the need for country-specific and country-driven solutions for developing capacities and partnerships that certainly go beyond technical MRV considerations and include a participatory process and the exploration of co-benefits and synergies.

[1] *UNFCCC SBSTA 30 decision and draft text for Copenhagen negotiated in June 2009 (should be available to workshop participants): http://unfccc.int/resource/docs/2009/sbsta/eng/l09.pdf*

Table 1. Overview of needs for guidance, analyses and advice on national MRV and key information available.

Need	Whose need	Key information provided by
International principles and guidance for measuring & reporting on carbon stock changes & emissions	Individual Parties	IPCC Good Practice Guidance for LULUCF[2]
Additional information on methods and procedures for MRV	Individual Parties	GOFC-GOLD Sourcebook[3]
Analysis of current national MRV capacities	Individual Parties; International community	Assessment of national forest monitoring capacities[4]
Analysis on costs of developing national MRV systems	Individual Parties International community	UNFCCC technical paper on costs for REDD MRV[5]
Concepts for national REDD architectures (incl. link of policy and MRV)	Individual Parties	CIFOR book on national REDD architecture and policies
Advice on how to develop national MRV system	Individual Parties	UN REDD program (framework, www.un-redd.org)

CIFOR has been proposing the "3 E's concept" of efficiency, effectiveness and equity as guidance for both REDD related policies and MRV developments and their linkages in REDD readiness and implementation. The 3 E's concept, for example, provides a framework to consider the diverse set of needs and requirements for both policy and MRV on the national and sub-national level:

Efficiency: using transparent, consistent and cost-effective data sources and procedures, sets up an institutional infrastructure and establishes sustained capacities within the country that meet its national and international REDD+ requirements and enables to report forest carbon changes using the IPCC GPG in the long-term;

Effectiveness: supports and is driven by the development and implementation of a national REDD+ policy and its areas of priority area of actions;

Equity: integrates MRV actors and activities for local measurements and monitoring, national-level monitoring and estimation, and international guidance, and supports independent review, to ensure participation and transparency among different stakeholders involved.

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[2] *Guidelines (2003) on Land Use Land Use Change and Forestry (LULUCF), focus on chapters 2 and 3: http://www.ipcc-nggip.iges.or.jp/public/gpglulucf/gpglulucf.html, Guidance on Agriculture Forestry and other Land Uses (AFOLU), focus on chapters 1-4: http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol4.html*

[3] *GOFC-GOLD REDD technical sourcebook, updated version published in July 2009: http://www.gofc-gold.uni-jena.de/redd/sourcebook/Sourcebook_Version_July_2009_cop14-2.pdf*

[4] *An assessment of national forest monitoring capabilities in tropical non-Annex I countries: http://princes.3cdn.net/8453c17981d0ae3cc8_q0m6vsqxd.pdf*

[5] *UNFCCC/SBSTA technical paper on costs of monitoring for REDD published in June 2009: http://unfccc.int/resource/docs/2009/tp/01.pdf*

These considerations currently provide the most comprehensive and up to date set of guidance and foundations to develop MRV systems as part of national readiness process. Building upon the existing guidance and principles, the workshop discussions did go deeper in assessing requirements and capacity needs, and providing suggestion for MRV capacity development strategies and actions that reflect Guyana's specific country circumstances. As a result, the MRV development process will follow the fundamental assumptions:

1. The overall goal is to establish a capacity development process to implement a sustained MRV system for implementing REDD policies and results-based compensation for such activities in the long-term as a contribution to Guyana's low carbon development pathway. In general, any progress for REDD+ MRV fosters integrated decision making for resource management, and, thus, by itself, provides on important foundation for any future development.
2. The development of a national REDD+ MRV system uses a phased approach along a roadmap that specifies near-term priorities & long-term targets and is based on:
    a. Building upon existing capacities and data, international requirements and national needs for Guyana's REDD participation,
    b. the objective to support annual estimation, reporting and verification of forest-related carbon emissions and removals at the national level,
    c. the need to maintain some flexibility to adjust the activities in case the details of REDD compensation mechanisms are agreed internationally;
3. The MRV system evolution is directly linked with REDD+ policy development and implementation and contains a systematic national monitoring, reporting and verification system and a sub-national program to support MRV for local REDD+ activities;
4. An strong institutional base and the establishment and maintenance of partnership and cooperation at all levels provides the framework:
    a. a steering body coordinating all REDD+ MRV activities and the implementation of the roadmap,
    b. the Guyana Forestry Commission as executive agency,
    c. a process for involving all relevant national stakeholders involved in MRV and REDD implementation and mechanisms to ensure transparent and open exchange and management of data,
    d. building partnerships and cooperation with key national and international organizations that help Guyana in implementing the road map.

4.3 Capacity gap assessment and key actions

During the workshop considerable amount of time was spend to discuss current data and capacities and how they relate to requirements for REDD+ participation. The evaluation of Guyana's capacities and REDD specific characteristics provide the basis to specify the recommendations and next steps. Starting with an assessment of current capacities, additional information on country-specific characteristics and requirements for REDD were analyzed and discussed. The capacity gap assessment was performed for both international requirements (IPCC GPG) and national needs (through an assessment of current forest change processes).

Appendix F provides an overview of requirements, existing data capacities and suggested activities to fill the data gaps. It is clear that basic data need to be acquired and capacities build until Guyana can provide estimations and reporting fulfilling the IPCC principles and requirements. Breakout group discussed in detail some of the next steps needed to fill some of the identified gaps (Appendix C).

Appendix G lists the current processes causing forest carbon stock identified by the workshop participants. The assessment also includes some information on the process characteristics, its estimated carbon impact and current monitoring. None of the processes are currently monitored with level of certainty and detailed required for MRV of REDD actions. Existing data and information of the activities are varying. From a carbon impact point of view, the land use changes resulting in the removal of native forests causing most of current emissions. There are basically no human activities currently active in Guyana that directly increase forest area and forest carbon stocks.

Based on the assessment provided in Appendix G, one breakout did discuss in more detailed the drivers of forest carbon change (Appendix D). The results are important for the REDD MRV systems since activities of drivers need to be monitored as well, such knowledge are key to formulate policies, and a solid understanding is important for setting the reference level and conducting explorations of future development. The breakout group focusing on community participation highlighted an important capacity gap in terms of both REDD participation and MRV (Appendix E). As synthesis of the capacity gap assessment, the national MRV development principles defined in the previous section, and the break out group discussion, a number of seven key action areas were defined as immediate activities for starting the capacity development for Guyana:

1. Develop and implement a national mechanism and institutional framework:
   - Steering body for the MRV system development (Office of Climate Change, Office of the President as coordinator of activities)
   - Coordination and integration of national datasets through a high-level national technical committee accompanied by a related legislative reform and development of a national data management system and infrastructure
   - Participation, scientific advice and international partnering, i.e. through the establishment of a technical and scientific advisory group
2. Conduct a comprehensive forest area change assessment for a historical period:
   - Processing and interpretation of historical archived satellite datasets at national level for forest area change, benchmark forest map and exploration of the monitoring of forest degradation
   - Capacity building component included from the beginning
3. Build carbon stock measurement capacities:
   - Design a national and sub-national stratification
   - Design Protocols and implement measurements in all carbon pools
   - Targeted sampling and surveys to establish national conversions/expansion factors
4. Develop MRV for a set of REDD demonstration activities
   - Focus on key drivers/processes and engagement with implementation actors (i.e. land owners, communities)
   - Conduct detailed monitoring at demonstration sites
5. Engagement with international community:
   - Explore the possibility of the GEO forest carbon tracking task to help in satellite data acquisition from 2009 onwards
   - Partner with international organizations and research partners
   - Seek further advise/coordination with international activities
6. Sustained internal communication mechanism on MRV:
   - Development communication plan and outreach materials
   - Conduct a series of regional workshops and consultation to inform about REDD and MRV
7. Conduct/support research on key issues
   - Scoping exercise for linking policy and MRV (actions, transactions)
   - Detailed national driver assessment and methods for reference level projection
   - Co-benefits of MRV (i.e. to support LCDS) and tools for decision-support in the context of integrated natural resources management

The execution of the work will be centralized at the Guyana Forestry Commission and this agency will be the focal agency for coordinating all aspects of data collection, analysis, research execution and assessments and for routine continuous monitoring of the system. This agency will work with all consultants, data providers and suppliers, and stakeholders of the MRVS.

4.4 MRV capacity development roadmap

The development of a road map for the establishment of a system for measurement, reporting, and verification (MRV) as an initial investment to participate in any REDD mechanism requires the consideration of a number of necessary steps and different types of gaps to be addressed in different phase (Appendix H and Appendix I). This road map lists expected outcomes and capacity improvements for these different phases, as well as, a set of specific activities to fill four different types of gaps.

Most importantly, REDD policy should drive MRV activities and vice versa, and this interaction needs to be established from the beginning. Thus, one of the fundamental questions initially is whether sufficient data are existing for the country to explore REDD opportunities and formulate a national REDD policy strategy and scope, and demonstrate implementation activities. This issue is targeted in the first phase and should be tackled right away. The seven priority action areas from the workshop discussions provided in the previous section will be used as baseline to specify efforts for the first phase. Activities include the establishment of missing institutional arrangements and filling some existing gaps to first derive initial datasets (data gap filling) to provide a thorough understanding on the activities of drivers and processes and their forest carbon impact, and how policies can be defined and implemented to affect them. In this phase, Guyana will also be aiming to build basic capacities to report on a set of interim performance indicators that will respond to an international REDD mechanism.

The co-evolution of the MRV system and the national policy mechanisms to support the positive impact of REDD+ actions continues in the readiness phase where the development of technical capacities, institutional arrangements and policies will result in the establishment of the reference level. This process will help provide the foundations for the eligibility to participate in REDD results-based crediting mechanisms. In both the readiness and the implementation phase the large emphasis on measurements and monitoring will be extended to reporting and verification, i.e. through the establishment capacities to apply the IPCC GPG for international reporting.

The implementation process may also include an effort to fill a methodological gap. Initial measurement and monitoring activities will use readily available (historical) data and methods that may be limited in achieving, for example, accuracy and completeness in national forest carbon monitoring and the GHG inventory. Furthermore, a consolidated national REDD implementation strategy and an analysis of IPCC key categories will result in a prioritization of what needs to monitored, reported and verified in the long term with the main objective being to contribute to efforts in the key areas and processes designated with respect to REDD implementation actions.

The current road map (Appendix H and I) is associated with a timeline of 2010 for phase 1, 2011/12 for phase 2 and post 2012 for the implementation phase. This timing reflects the current planning and maybe accelerated to move towards a full Tier 3 system if desired.

Appendix A: List of participants for workshop

Name	Representing
Lorena Vaca	Amerindian People's Association
Curtis Bernard	Conservation International Guyana - Guyana
Eustace Alexander	Conservation International Guyana - Guyana
David Singh	Conservation International Guyana - Guyana
Hans Thompson	Environmental Protection Agency
Sean Mendonca	Environmental Protection Agency
Asna Sharief	Environmental Protection Agency
Geeta Devi Singh	Environmental Protection Agency
Omar Ramcharran	Environmental Protection Agency
Nadia Nassir	Environmental Protection Agency
Chris Ingelbreckt	European Union
Martin Herold	Wageningen University / GOFC-GOLD
Hilbertus Cort	Forest Products Association
Derrick Cummings	Forest Products Development and Marketing Council
Laura T. Singh	Forest Products Development and Marketing Council
Mahender Sharma	Guyana Energy Agency
Sandra Britton	Guyana Energy Agency
Jagdesh Singh	Guyana Forestry Commission
Pradeepa Bholanath	Guyana Forestry Commission
Edward Goberdhan	Guyana Forestry Commission
Nasheta Dewnath	Guyana Forestry Commission
Kenny David	Guyana Forestry Commission
Quacy Bremner	Guyana Forestry Commission
Gavin Agard	Guyana Forestry Commission
Romayne Atkinson	Guyana Forestry Commission
Sonya Reece	Guyana Forestry Commission
Pashen Peters	Guyana Forestry Commission
Rawle Lewis	Guyana Forestry Commission
Carey Bhojdat	Guyana Forestry Commission
Handsajie Sookdeo	Guyana Forestry Commission
Darshnie Rampersaud	Guyana Forestry Commission
Sumedha Mahadeo	Guyana Forestry Commission
Anna Mohase	Guyana Forestry Commission
Raj Singh	Guyana Forestry Commission - Board of Directors
Vanessa Benn	Guyana Forestry Commission - Board of Directors
Kampta Persaud	Guyana Geology and Mines Commission
Terry Moore	Guyana Geology and Mines Commission
Dianne Mc Donald	Guyana Geology and Mines Commission
Donald Singh	Guyana Geology and Mines Commission
Sheron Dingrid	Guyana Geology and Mines Commission
Karen Livan	Guyana Geology and Mines Commission
Naseem Nassir	Guyana Lands and Surveys Commission
Elvin Codier	Guyana National Newspaper Ltd.
Colin Klauthy	Guyana Organisation of Indigenous Peoples
Yolanda Glen	Guyana School of Agriculture
M. Stewart	Guyana Sea Defence
Ashley Adams	Guyana Sugar Cooperation
Zaimool Rahaman	Hydrometerological Department
Leslie Lin	Jailing Forest Industries
Lennox Cornette	Jailing Forest Industries

Patrina Lakhan	Media
Alfred King	Ministry Culture, Youth & Sports
Hymawattie Lagan	Min. Human Services, Women's Affairs Bureau
Annie Pitamber	Ministry of Agriculture
Kalina Ali	Ministry of Amerindian Affairs
Nigel Dharamlall	Ministry of Amerindian Affairs
Julie Sookram	Ministry of Amerindian Affairs
Sharon Austin	Ministry of Amerindian Affairs
Jason Fields	Ministry of Foreign Affairs
Robert Narine	Ministry of Public Works
B. Chintamenie	National Agriculture Research Institute
Romel Simon	National Amderindian Development Foundation
Thorne Carmicheal	National Drainage and Irrigation Authority
R. Jeffery	National Drainage and Irrigation Authority
Derrick John	National Tosahos' Council
John Andries	National Tosahos' Council
Hidebrand James	National Tosahos' Council
Micheal Williams	National Tosahos' Council
Bernard Laud	National Tosahos' Council
Ernest Dundass	National Tosahos' Council
Christopher Edwards	National Tosahos' Council
William Peters	National Tosahos' Council
David Wilson	National Tosahos' Council
Herbie Campbell	National Tosahos' Council
Lester Flemming	National Tosahos' Council
Maxwell Andrew	National Tosahos' Council
Ernest Samuels	National Tosahos' Council
Sonya Reece	Office of Climate Change
Shyam Nokta	Office of the President
Ronald Bulkhan	Precision Woodworking, Guyana Manufacturers and Services Assoc.
Patsy Ross	UNDP
Richard Persaud	UNDP - Guyana Shield Initiative Project
Lawrence Lewis	University of Guyana
Paulette Bynoe	University of Guyana
John Caesar	University of Guyana
Susy Lewis	University of Guyana
William German	USAID
Winston Harliquin	USAID

Appendix B: Workshop agenda

REDD MRV Workshop for Guyana: linking policy and monitoring requirements and facilitating the development of national ToR

27. October

Session 1 Opening:

Welcome and Remarks on behalf of GFC Commissioner - Ms Pradeepa Bholanath, GFC- 5 minutes
Remarks by Prof. Dr. Martin Herold- 5 minutes
Remarks- Mr. Shyam Nokta, Office of Climate Change- 5 minutes
Remarks by Minister of Agriculture- Minister Robert Persaud, MP, MBA - 10 minutes

Morning break

Session 2: REDD+ the international context

Status of REDD+ and MRV at UNFCCC negotiations, status of REDD+ initiatives in FCPF and UN-REDD, other REDD+ developments at the international level, the need for domestic policy linkages.
(30 min + discussion, Martin Herold)

Lunch

Session 3: REDD+ - the Guyana context

Review of Guyana's FCPF REDD+ initiative and the current status; review of Guyana MRV process and current plans and status. The context of this current exercise.
(20 min + discussion, Pradeepa Bholanath)

Afternoon Break

Session 4: Drivers, processes and policy

Presentation and assessment of current drivers/processes affecting forest carbon and current monitoring activities
2 hours, presentation by national expert Nasheta Dewnath + discussion, facilitated by Martin Herold
Session included plenary discussions with the Honary Samuel Hinds (Prime Minister of Guyana) and his Excellency Bharrat Jagdeo (President of Guyana)

28. October 2009

Session 5: Policy and MRV implications, and IPCC GPG training

Assessment of drivers and REDD+ policy options with respect to MRV requirements
(10 min presentation + 20 min discussion, Martin Herold)

Training and introduction of IPCC Good Practice guidelines and requirements
(30 min presentation + 30 min discussion, Martin Herold)

Starting with breakout group discussions

Morning break

Work and discussions in breakout groups:

1. Data and capacity gap assessment and scoping of next activities
2. Drivers and processes of forest carbon change
3. Community participation

Lunch

Session 6: Develop roadmap and priorities

Presentation reports from breakout groups

Presentation and discussions on MRV capacity development road map and priorities for Guyana (30 mins + discussion, Pradeepa Bholanath + Martin Herold)

Afternoon Break

Session 7: Synthesis and closing

Closing, suggestions and remarks by the honorable Prime Minister the Honary Samuel Hinds

Appendix C: Summary of discussion in breakout group 1 on capacity gap assessment and next steps

Suggested next steps:

- **Capacities are needed and development should start from the very first day, data gap filling is important maybe initially based on stronger international engagement**
- **National mechanism to gather and coordinate activities:**
    - Joint database at national level, compatible, involvement of key agencies: Lands and Survey, Geology and Mines, GFC
    - Need to set up coordination national mechanism, revitalize GINRIS-system, use and feed into LCDS framework, upgrade to use a broader set of data types
    - Agriculture/lease tracking (shape files) and need to track actual forest change
    - Office of climate change coordinates MRVS

- **Activity data assessment using remote sensing and GIS based for area change:**
    - National definition of forest land and forest land change, to capture human-induced changes,
    - Satellite data to be acquired by Guyana, seek to use a variety of sources
    - Start with historical data in archives
    - Annual coverage intended with satellite data, consider the issue of seasonality, maybe not all data analyzed wall to wall annually
    - Accuracy assessment for forest maps and change data, requires field work
    - Identification of mapped forest change processes at second step

- **Carbon stock, changes and emissions factors:**
    - Utilize current existing inventory data and timber harvesting - data to be converted into carbon (stocks and emissions)
    - Efforts: Carbon conversion, expansion factors, wood density, root/shoot ratio based on destructive sampling program
    - Phased approach, improve carbon data and estimations over time
    - IPCC uncertainty assessment from the beginning, error propagation important
    - Statistical analysis need to be done for sampling design: national carbon density stratification and establish, i.e. 900 permanent plots (tbd)
    - May use satellite data or other proxies to keep update on activities and stratification
    - Sample plots and in situ measurements, what's the purpose:
        - For national factors, destructive sampling
        - Systematic national sample to provide solid carbon numbers, System of invisible plots? 900?
        - Address a variety of drivers and activities - 2 sets of temporary or permanent plots based on stratification:
            - General changes (random temporary based area change and monitoring) – implemented by land agencies
            - REDD activity-based measurements (involve REDD implementers!)
        - Decide on carbon pools, perhaps aim for measure all initially? At selected locations, where are the high-carbon soils?
- Research task to study natural carbon dynamics (sample plots in natural forest areas)

Appendix D: Summary of discussion in breakout group 2 on drivers of forest change and MRV implications

The Group identified that while there are a number of drivers that currently affect carbon stock and will also do so in the future. These drivers were classified based on the following categories:

1. **POLICY / INSTITUTIONAL**
    - Socio-economic governance
    - Overlaps in land use policies
    - Incentives/ disincentives at the national and local level
    - Inadequate capacity (technical, institutional & human)
2. **SOCIO-ECONOMIC DRIVERS**
    - Market forces
    - Poverty
    - Livelihood enhancements
    - National development plans
3. **DEMOGRAPHIC SHIFTS**
    - Spatial
    - Population increase
4. **CULTURAL**
    - Customs &Belief systems (use of firewood & spirituality)
    - Agricultural practices
5. **ECOLOGICAL**
    - Natural & spontaneous fires
    - Dieback
    - Forest regeneration
6. **TECHNOLOGY**
    - Efficiency & effectiveness in natural resources utilization & management

Processes that effect forest carbon stocks	Drivers of Forest Carbon Change	Who is responsible for the execution of the activity and for what purpose (historical, current, future)	Importance (carbon impact)	Current data and monitoring activities	Scoping for REDD policy opportunities
FOREST LAND CONVERSION FOR AGRICULTURE (including aquaculture)	Policy / Institutional	Investors	High	GL&SC GFC – in the case of the quick assessment report EPA Ministry of Agriculture NARI	National Development Strategy, National Competitiveness Strategy, draft LCDS, Agricultural diversification Strategy, relevant legislations governing various agriculture and land use in the sector – e.g Fisheries Act, etc.
	Socio-Economic				
	Demographic Shifts	Local populations/ communities/ villages			
FOREST CONVERSION FOR MINING	Policy / Institutional	Local miners and companies	High	GGMC GFC - in the case of the quick assessment report EPA	Mining Legislation, draft LCDS, Land Use Plan of which Regional Plans exists for some regions.
	Socio-Economic				
	Demographic Shifts				
	Technology				
LOGGING ACTIVITIES	Policy / Institutional	Holders of Forest Leases	High	GFC EPA	Forest legislation, National Forest Policy, National Forest Plan, various GFC guidelines, draft LCDS
	Socio-Economic				
	Demographic Shifts				
	Technology				
ROADS	Policy / Institutional	Government agencies Forest Lease holders	High (e.g. Georgetown Lethem Transportation	Ministry of Public Works	Roads Act, Community and Village Management Plan, EPA Permitting and Regulator

	Socio-Economic Demographic Shifts	Miners Developers	Corridor)	GFC EPA Ministry of Housing Ministry of Local Government (to a lesser extent)	requirements, GFC's guidelines (strategic plan, forest management plan and annual operational plan)
HOUSING	Policy / Institutional Socio-Economic Demographic Shifts	Government agencies Forest Lease holders Miners Developers Communities/ villages		Ministry of Housing Forest Lease Holders Mine Lease Holders And Developers Ministry of Local Government	Housing Act, Planning Act, Forest Annual and Forest Management Plan
ENERGY DEVELOPMENT	Policy / Institutional Socio-Economic Demographic Shifts Technology	Investors Multilateral institutions Government agencies	Medium	GEA Office of PM EPA GOInvest	Energy/Utilities Act, National Competitiveness Strategy, draft LCDS,
FIRES – Fires for sustainable use will not be included.	Socio-Economic Demographic Shifts Cultural Ecological	Local communities Villages Farmers Hunters	Small on individual level- cumulatively, this impact needs to be determined	GFC Local communities Villages	Communities and Village Plans
ISSUE OF SUBSISTENCE FARMING	Socio-Economic Demographic Shifts Cultural	Local communities Villages	Small on individual level- cumulatively, this impact needs to be determined	Local communities Villages Community based NGOs	Amerindian Act, Community Management Plans, Village Plan

FOREST PROTECTION	Policy / Institutional Socio-Economic Demographic Shifts Cultural	NGOs GFC EPA Local communities Villages Large concessionaires	Medium	EPA NGOs(National and International) GFC National Parks Commission Ministry of Amerindian Affairs	EPA Act, GFC Act, Forest Management Plan, Amerindian Act, Village Plans, Iwokrama Act, National Protected Area System
LOCAL AGRICULTURAL ECONOMIES IN TRANSITION	Socio-Economic				
	Demographic Shifts Technology	Local communities Villages	Small on individual level- cumulatively, this impact needs to be determined	Ministry of Agriculture Ministry of Finance through GOINVEST	Amerindian Act, Community Management Plans, Village Plan Community Based natural resources management (C BNRM)
MANGROVE IMPROVEMENT FOR SEA DEFENCE PURPOSES	Policy / Institutional Ecological	GFC Sea Defence Department EPA		Sea Defence GFC EPA	Sea Defence Act EPA Act National Mangrove Management Plan Coastal Zone Management Plan

Recommendations for MRV

1. MRV should monitor not only processes but also the drivers
2. Establishment of formal partnerships with remote sensing community and Space agencies e.g. through GEO and Wageningen University/SAR Vision
3. University of Guyana should be integrally involved in process
4. There is need for greater involvement of the national security forces (illegal farming & airstrips)
5. Greater collaboration amongst state agencies e.g. GFC, GGMC, GL&SC
6. Data must be consistent, reliable & reproducible
7. Methodology & results of MRV must be consistent with those of National Communications to UNFCCC
8. Coverage must be not only for State Forest Estate but also for total forest cover- leakage
9. Thorough capacity needs assessment
10. Build capacity in areas critical to the MRV e.g. modelling – capacity built must be sustained
11. Establishment & management of a data clearing house
12. Enhancement of stakeholder engagement process e.g. communication, education & awareness & consultations

Appendix E: Summary of discussion in breakout group 3 on community participation and recommendations

Village and Community Participation in the MRV
The successful management of all natural resource must take into account the relationship amongst the communities, villages and government agencies.

Roles of the Villages and Communities

- Development of community and village plans respectively. In order to benefit from the REDD these plans will need to meet national guidelines including the national MRVS.
- The village council will be responsible for the implementation of the plan.
- The council will also undertake monitoring and reporting.
- The communities and villages can and should contribute and participate in the national MRVS.

Capacity Development and Needs

1. Integrated resource management
2. Management planning, including Mapping, forest inventory, tree spotting, monitoring etc.
3. Communication. This area is required by ALL stakeholders and does not only refer to communities and villages, but also importantly to state agencies etc.
4. Report writing
5. Awareness in stakeholder engagement processes
6. Data management (processing, analyzing and archiving)

The steps forward

1. Creating village and community rules.
2. Baseline resource mapping
3. Basic knowledge and education on climate change, the Low Carbon Development Strategy and Reducing Emissions from Deforestation and forest Degradation.

Since logging, mining, farming, housing, road construction etc. are all part of the daily lives of the village and communities; will like to know how these plans will impact on their livelihood before they are able to participate.

Questions and Comments

1. Communities and village are of the opinion that there is a difference between GFC monitoring and community and village monitoring. How will the national MRVS impact on either of the regulations the community and village and the GFC?

2. Resource management planning is an important first step for communities and villages to be involved in especially as it is part of the Amerindian Act. For villages to benefit from REDD and the LCDS and these plans must meet national guidelines. The minister of Amerindian Affairs has asked for communities and villages to submit plans but so far only a few have done so how will these two initiatives be related to each other?

3. MRVS should include mechanisms on how Indigenous people's rights will be protected according to the international law (UNDRIP).

4. The RPP indicated roles of the local communities in REDD, how does this relate to the opt in/ out clause of the LCDS?

Appendix F: Capacity gap assessment for international requirements (IPCC GPG)

Variable	Focus	Analysis of Existing observations and data records (i.e. satellite data, airphotos, surveys) and information (estimates, rates, factors etc.)	Proposed activities to fill data and capacity gaps for measurement and monitoring
Area changes (activity data)	Deforestation	• No consistent historical record of forest area changes • Preliminary assessment for 2007/08 using Landsat data • Some data of activities (processes) with governmental agencies - Data on areas affected (concessions, leases) need to be integrated on national level	• Implement a comprehensive forest area change assessment based on archived satellite data and using existing national datasets • Develop sustained capacities to conduct regular and consistent forest area change monitoring using remote sensing and GIS
	Reforestation	• No consistent historical record of forest area changes • Reforestation not major issue in Guyana	See above with emphasis to detect forest regrowth (note: not a significant process currently in Guyana)

Changes in carbon stocks / emission factors	Land use change (aboveground)	• No consistent national forest inventory
		• No data on actual carbon stocks, emission factors - current use of IPCC default data for carbon stocks and conversions
		• Suitable national forest stratification for forest carbon densities?
		• Some initial biomass monitoring, permanent sample plots have been established recently
			• Establish capacities and implement a systematic national forest carbon measurement and monitoring system, i.e. through permanent sample plots, including:
			  ○ A suitable national carbon density stratification
			  ○ Acquisition of key measurements in situ
			  ○ Allometric data (for biomass conversion and expansion factors)
			  ○ Carbon fraction values considering country-specific stratification
			• Subnational measurement program to monitor key activities

	Degradation & increases in C-stocks (aboveground)	• No consistent national forest inventory and information and forest degradation • Logging concession areas and harvest estimates • No data on actual carbon stocks and emission factors • Some initial permanent sample plots have been established recently	• Suitable carbon conversion procedures for existing data • Subnational measurement program to monitor key REDD activities • Long-term measurement efforts to quantify emission factors and net-carbon changes for different degradation processes • Regular monitoring of activities causing forest degradation

	Other pools (i.e. soils)	• Soil carbon may be key category (1/3 of current estimates of terrestrial carbon pool • Impacts from deforestation and degradation unknown • No consistent national data?	• Identification of national carbon stock key categories • Include all pools initially in fieldwork to understand key categories
Biomass burning	Emissions of several GHG	• No consistent national data on areas effected and carbon impact	• Understanding of natural fire regime and expected changes with climate change • Include fire satellite observations and in forest area change associated will fieldwork
Spatial data infrastructure	Drivers & factors of forest changes, Centralized database	• National coverage of GIS data is available for number of baseline datasets • Consistent national database integrating relevant data is missing	• Establish national mechanism to gather relevant data on national level • Build a spatial data infrastructure integrating all IPCC relevant data for reporting

Appendix G: Capacity gap assessment for national needs (forest change processes)

Processes that effect forest carbon stocks	Who is responsible for the execution of the activity?	Effects on the forest (carbon effect per ha): sink or source	How important is the process nationally (area affected)?	Importance (carbon impact)	Current responsibilities & data/monitoring activities and capacities	Suggested activity to fill data gap in the near term
Forest land conversion for agriculture (Livestocks, crops, and aquaculture)	Investors	Source - Large	Large	Very high	GL&SC GFC – in the case of the quick assessment report Some data on area change and non on carbon emissions	1. Gather/integrate existing data on the national level 2. Remote sensing based area / land use change assessment 3. In situ carbon stock measurements & conversion of inventory data
Forest land conversion for mining	Local miners and companies	Source – large, low to medium if rehabilitation to improve carbon stock in the future	Large	High	GGMC GFC - in the case of the quick assessment report Some data on area change and non on carbon emissions	1. Gather/integrate existing data on the national level 2. Remote sensing based area / land use change assessment 3. In situ carbon stock measurements & conversion of inventory data
Logging activities	Holders of Forest Leases	Source – medium to low (depending on level of sustainability and long term regeneration)	Large	High	GFC-concessions Some data on area affected and harvest estimates (non on carbon emissions and long term effects)	1. Gather data on national level and evaluate data with remote sensing assessment 2. Conversion of existing harvest estimates into carbon 3. Additional field measurements 4. Study long-term effects
Forest land conversion for roads	Government agencies Forest Lease holders Miners Developers	Source - large	Large	Very high	Ministry of Public Works GFC EPA Some data on area change and non on carbon emissions	1. Gather/integrate existing data on the national level 2. Remote sensing based area / land use change assessment 3. In situ carbon stock measurements & conversion of inventory data

Forest land conversion for urban development (housing)	Government agencies Forest Lease holders Miners Developers	Source - large	Medium	High	Ministry of Housing Forest Lease Holders Mine Lease Holders And Developers Some data on area change and non on carbon emissions	1. Gather/integrate existing data on the national level 2. Remote sensing based area / land use change assessment 3. In situ carbon stock measurements & conversion of inventory data
Forest land conversion for energy development	Investors Multilateral institutions Government agencies	Source - large	Medium	High	GEA Office of PM EPA Some data on area change and non on carbon emissions	1. Gather/integrate existing data on the national level 2. Remote sensing based area / land use change assessment 3. In situ carbon stock measurements & conversion of inventory data
Fires (agricultural fires and accidental burning of forest)	Local communities Villages Farmers Hunters	Source - medium	Small	Medium	GFC Local communities Villages Limited data on area affected and non on carbon emissions	1. Gather data on national level and evaluate data with remote sensing assessment 2. Targeted ground surveys to assess carbon impact
Issue of subsistence farming (incl. Fire)	Local communities Villages	Source - zero to medium (depending on fate of land, maybe carbon neutral in the long term	Small	Low	Local communities Villages Community based NGOs No data on area change and non on carbon impact	1. Engage communities/NGO in monitoring 2. Gather data on national level and evaluate data with remote sensing assessment 3. Targeted ground surveys to assess carbon impact
Forest Protection	NGOs GFC EPA Local communities Villages Large concessionaires	Overall carbon Neutral but large if counted as avoided source	Large	High	EPA NGOs(National and International) GFC National Parks Commission Ministry of Amerindian Affairs Some data on area change and limited on carbon stocks	1. Gather data on national level 2. In situ carbon stock measurements & conversion of inventory data

Forest land conversion for local agricultural economies in transition	Local communities Villages	Source - large	Small	Medium	Ministry of Agriculture Ministry of Finance through GOINVEST Limited data on area change and non on carbon emissions	1. Gather/integrate existing data on the national level 2. Remote sensing based area / land use change assessment 3. In situ carbon stock measurements & conversion of inventory data
Mangrove improvement for sea defense purposes	GFC Sea Defense Department EPA	Sink - medium	Small	Low	Sea Defense GFC EPA Some data on area change and non on carbon sequestration	1. Gather data on national level and evaluate data with remote sensing assessment 2. Targeted ground surveys and in situ for carbon sequestration

Appendix H: MRV road map – objectives and expected key results

	National strategy (2010) ➔	Country readiness (2011/12) ➔	Implementation (post 2012)➔
Objectives	**Gather and integrate information & fill data gaps for national REDD opportunities, scoping and policy development**	**Develop capacities, conduct historical monitoring, and implement a (minimum) IPCC Tier 2 national forest carbon monitoring; establish the reference level and report on interim performance**	**Establish consistent and continuous MRV supporting national REDD+ actions and international IPCC GPG-based reporting and verification**
Key results and national capacities developed	1. Comprehensive MRV roadmap developed and national MRV steering body operational 2. Improved national capacities on LCDS, REDD, IPCC-LULUCF, and carbon dynamics 3. Framework and capacities to demonstrate REDD implementation and interim performance 4. All data available and accessible (including acquisition of new forest carbon data) on drivers and processes needed for developing a national REDD policy and interim implementation plan 5. Established communication and participation mechanism to involve relevant stakeholders nationally and internationally 6. Approaches for setting reference levels, linking MRV and policy, and MRV co-benefits and synergies are explored and defined	1. Capacities in place for consistent and continuous acquisition and analysis of key data for Tier 2 nationally and Tier 3 for demonstration/activity sites including international reporting using IPCC LULUCF; uncertainty assessment MRV improvement plan developed 2. Reference level established based on historical data, and future developments using internationally accepted methods 3. All data available and accessible for an updated national REDD implementation plan 4. Regular reporting on REDD demonstrations and interim performance 5. Continued engagement with key national stakeholders for REDD implementation and assuring long-term sustainability of MRV capacities (i.e. universities) 6. Monitoring system explored to cover key variables for other ecosystem services	1. IPCC key category analysis and assessment for Tier 3 approaches completed and implemented (if desired) 2. Independent international review of full MRV system completed 3. Capacity in place and implementation to deliver verification and compliance assessment for REDD results-based compensation 4. National data infrastructure of forest greenhouse gas inventory and assessment in place for regular reporting 5. Implementation plan to use new and proven technologies to reduce uncertainties and increase efficiency of MRV system 6. Framework developed that links REDD into LCDS monitoring, reporting and verification system

Appendix G: MRV road map – specification of activities for gap filling

	National strategy ➔	Country readiness ➔	Implementation ➔
Objectives	**Gather and integrate information & fill data gaps for national REDD opportunities scoping and policy development**	**Develop capacities, conduct historical monitoring, and implement a (minimum) IPCC Tier 2 national forest carbon monitoring, establish the reference level and report on interim performance**	**Establish consistent and continuous MRV supporting national REDD+ actions and international IPCC GPG-based reporting and verification**
Data gap filling	• Gather, evaluate and integrate existing data sources on the national level • Acquire additional data (if needed) to analyze (the carbon impact) of all relevant historical forest change processes and drivers (i.e. using satellite data, initial carbon stock assessments and ancillary information) • Assessment of historical and current processes of forest carbon change for formulating national REDD policy strategy and related MRV priorities, and respond to an initial set of interim performance indicators	• Establish mechanisms and partnerships with relevant data sources (i.e. satellite data) to facilitate availability to Guyana in a consistent and continuous way • Data gathering and analysis of drivers and factors of forest carbon change to support an assessment of future driver activities and related/projected forest carbon changes • Collect data for a first comprehensive uncertainty assessment of the different measurement and monitoring components	• Conduct an IPCC key category analysis • Assess opportunities and data gaps to move towards Tier 3 on the national or sub-national (if desired) • Foster and support REDD activity-based monitoring by different actors as part of national framework
Eligibility gap filling	• Develop a national REDD strategy • Involvement of all relevant stakeholders at the national and sub-national level – set up a sustained two-way communication mechanism • Participation in international REDD and REDD readiness processes • Scope a framework for immediate demonstration actions and interim performance indicators that will respond to an international REDD mechanism	• Continued involvement of all relevant stakeholders at the national and sub-national level • Provide an assessment of carbon emissions (and removals) as historical reference level and expectations/forecasting future development • Develop a national implementation plan and related policies to encourage REDD actions by relevant stakeholders • Implement and evaluate REDD implementation activities, and report performance for interim indicators	• Implement an international review of the MRV system • Prepare regular interactions and reporting on REDD implementation activities and on the IPCC LULUCF inventory • Verification and compliance assessment comparing performance against the reference level

Capacity and institutional gap filling	• Complete an comprehensive assessment of existing data and capacities considering international and national MRV requirements • Set up a national MRV coordination mechanism to steer the capacity development and assign roles and responsibilities • Develop capacities to monitor given a set of interim performance indicators • Engage in general capacity building on REDD, IPCC-LULUCF, terrestrial carbon dynamics and key standard methods • Interaction with local actors and key implementation bodies on their role for MRV	• Build sustained capacities to conduct regular and consistent forest and forest area change monitoring using remote sensing and GIS • Establish capacities and implement a systematic national forest carbon measurement and monitoring system, i.e. through permanent sample plots. • Scope and evaluate a sub-national, activity-based measurement program, to monitor key REDD implementation actions • Training and implementation of reporting (IPCC LULUCF) including an institutional framework • Develop and implement an uncertainty assessment and a long-term improvement plan for the MRV system • Scope the involvement of national/regional higher-education institutions	• Continuous training and improvement for institutions and activities providing data and analysis for the REDD MRV system, • Build a national spatial data infrastructure for IPCC LULUCF reporting and REDD implementation • Develop additional monitoring capacities (if needed, i.e. to go for Tier 3) • Build a system for verifying REDD actions on the national level using MRV data and other information, link MRV of transactions • Develop and implement an uncertainty assessment and a long-term improvement plan for the MRV system • Implement capacities in higher-education institutions on REDD MRV for university curricula
Methodological gap filling	• Interaction and partnership with national and international research organizations on key issues • Exploration of methods and approaches for establishing reference levels • Evaluate concepts for linking MRV, REDD policy and implementations • Explore potential co-benefits and synergies of the carbon measurements with other monitoring needs	• Interaction and partnership with national and international research organizations on key issues • Develop frameworks for interlinked implementing REDD policies and MRV and linking MRV of actions and MRV of transactions • Exploration of evolving technologies for REDD MRV • Assess the requirements of monitoring carbon variables and relevant information for other ecosystem services	• Foster activities to reduce uncertainties and increase efficiency of MRV system • Implement evolving technologies into regular REDD MRV activities • Finalise exploration of REDD MRV and implementation including broader ecosystem services and environmental accounting procedures and make recommendations.