



UN-REDD
PROGRAMME



Proceedings of the Consultative Workshop on the Pakistan's National Forest Monitoring System (NFMS) Action Plan

20th March 2014

at

FAO Conference Hall Islamabad





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Background of REDD+ in Pakistan

Pakistan has low forest cover mainly due to arid and semi-arid climate in large parts of the country. Total area of forests in the country is 4.34 million hectare (5%), out of which 3.44 million ha are state owned. Natural forests account for 4.2 million ha (4.8%), irrigated plantations occupy 103,000 ha (0.117 %) and rangelands cover 28.507 million ha (32.4 %) out of the total land area of 87.98 million ha (879,800 square kilometers).

Past trends and the current state of forests and forestry in the country indicate that large scale deforestation and degradation of natural forests has occurred. It continues unabatedly at the rate of 0.75 % per year (FAO 2007) due to many direct and indirect threats.

Pakistan joined the UN-REDD Programme in June 2011. Climate Change Division of Pakistan had already taken steps to introduce REDD+ by forming a National Steering Committee under the chairmanship of the office of Inspector General of Forests (OIGF). The OIGF also secured support from the One UN Joint Program on Environment (UNJPE) in May 2012 for a project to initiate REDD+ readiness activities with the assistance of International Centre for Integrated Mountain Development (ICIMOD) and World Wide Fund for Nature Pakistan (WWF-Pakistan). Main objectives of the project were awareness raising and capacity building of stakeholders on REDD+ concepts and the pre-requisites for implementing REDD+ programme, identification of capacity needs of stakeholders in the context of technical elements of REDD+ and preparation of a full scale national REDD+ project proposal for submission to the donors for further funding.

In December 2012, the country received Targeted Support Funds (TS) to develop a REDD+ Readiness Roadmap and Readiness Preparedness Proposal (R-PP) for Forest Carbon Partnership Facility Fund (FCPF) of the World Bank, to complement the work being done by the OIGF with the assistance of ICIMOD and WWF-Pakistan. Targeted Support will continue through to 2014 for the development of action plan and capacity building on Pakistan's National Forest Monitoring System (NFMS). Pilot activities related to REDD+ have also been initiated by the provinces of Khyber Pakhtunkhwa (KP) and Gilgit-Baltistan (GB) in the north of the country, where majority of the Pakistan's forest cover is located.

Recently WWF-Pakistan has signed an LOA with the Food and Agriculture Organization of UN (FAO) for the preparation of Action Plan and Capacity Building for a National Forest Monitoring System (NFMS). The major objectives of the project are:

1. National consultation workshop on NFMS Action Plan



2. Mapping of existing MRV capacity, gaps and need assessment
3. Developing standard methodology for spatial analysis of forest cover change
4. Assessment of data availability for LULUCF GHG inventory
5. Draft NFMS action plan (will be shared with provinces for improvement)
6. Training workshop on satellite forest monitoring system
7. Training workshop on national system for GHG inventory

The National consultation workshop on NFMS Action Plan was organized under the output-1 of the project regarding capacity building. The workshop was organized on 20th March 2014 at the Food and Agriculture Organization (FAO) main office in Islamabad.

Objectives of the Workshop

1. To launch the project “Preparation of Action Plan and Capacity Building for a National Forest Monitoring System (NFMS) for REDD+”;
2. To consult the stakeholders on development of NFMS Action Plan;

Workshop Participants and Agenda

The workshop was jointly organized by WWF-Pakistan OIGF, Climate Change Division and FAO. A total of 40 participants attended the workshop mostly from the provincial forest departments, civil society organizations and academia. Detailed list of the participants and agenda of the workshop are attached as Annex I and II respectively.

Summary of the Workshop Programme

Opening/Launching Session

The workshop formally started at 9:30 am with recitation from the Holy Quran by Mr. Irfan Akhtar, Assistant Manager Space and Upper Atmosphere Research Commission (SUPARCO). Syed Mahmood Nasir, Inspector General Forests welcomed the participants in his opening remarks about the workshop and highlighted the importance of REDD+. He showed his pleasure for the participation of all the provinces in the workshop indicating strong commitment of the Government of Pakistan including the provincial governments to conserve the forests. He further added that as part of the global process Pakistan had taken various steps in the context of REDD+ and tried to involve all the relevant departments, civil society organizations, academia and communities at every stage.

According to him the subject workshop was the corner stone of the entire REDD+ process and would highlight the action plan of Monitoring, Measurement, Reporting and



Verification (MRV) component of REDD+. He further added that Pakistan had to come across the quantifiable, reportable, verifiable and comparable international standards for this purpose. He recalled that the Government of GB was at the final stage of hiring the consultant and doing all those processes however they would have to wait till some standards and formats were developed and agreed for moving forward together.

At the end he said that the structure of the entire workshop was well organized by the joint efforts of Deputy Inspector General Forests (DIGF), WWF-Pakistan's team and UN-REDD focal person in Bangkok.

Presentations and Discussions

Overview of the REDD+ Process in Pakistan and Introduction to the Workshop

After the opening remarks, Mr. Muhammad Ibrahim Khan from WWF-Pakistan delivered a short presentation on the overview of REDD+ in Pakistan and introduction to the workshop. Key highlights of the presentation were:

- Initial national consultation and sensitization workshops on REDD+ (2009-2012)
- The REDD+ Project: Preparedness Phase for Pakistan (2012-2013)
- Support and follow-up activities for the REDD+ Readiness Roadmap process in Pakistan (2013)
- Major achievements of the REDD+ project
- Preparation of Action Plan and Capacity building for a National Forest monitoring system (NFMS) for REDD+ (2014)
- Outputs, objectives and detailed agenda of the NFMS workshop

Detailed presentation is given as annexure III (a).

Question and Answers-Discussion

Some of the participants were not clear about the terminology of "MRV" i.e. whether M stood for measurement or monitoring. Mr. Muhammad Ibrahim Khan clarified accordingly that the correct terminology is M & MRV where first "M" stands for monitoring and the later one stands for measurement.

International Context of REDD+

A presentation on international context of REDD+ was shared by Mr. Ben Vickers from UN-REDD/FAO Regional office for Asia-Pacific. Main themes of the presentation were:

- Scientific basis of REDD+ and role of forests in carbon cycle
- Human sources of Green House Gas (GHG) emissions



- Political basis of REDD+ like the United Nations Framework Convention on Climate Change (UNFCCC) which include the Kyoto Protocol, the Bali Action Plan and the Nationally Appropriate Mitigation Actions (NAMAs)
- Evolution of REDD+ UNFCCC: COP 11—Montreal 2005, COP 13—Bali 2007, COP 16—Cancun 2010, progress since Cancun (2011-2013) which include COP 17—Durban 2011, COP 18—Doha 2012 and COP 19—Warsaw 2013
- Key issues and Challenges for REDD+ include:
 - a. Approaches to REDD+ policy formulation and implementation
 - b. Governance of REDD+ implementation
 - c. Methodologies for forest monitoring and transparent data sharing
 - d. Cost effective and transparent approaches to carbon measurement
 - e. Assessment of the specific drivers of deforestation and forest degradation
 - f. How to implement and provide information on the REDD+ safeguards
 - g. Approaches of distributing REDD+ incentives e.g. financial and others

- REDD+ capacity building support by UN-REDD Programme include supporting of REDD+ Readiness (phase 1 and phase 2 of REDD+)
- Countries receiving support from the UN-REDD Programme
- Role of FAO in UN-REDD Programme
- Assimilation of Pakistan in UN-REDD Programme

Detailed presentation is in annexure III (b).

Question and Answers-Discussion

A question was raised about the role of federal government in the legislation regarding timber business. Syed Mahmood Nasir (IGF) replied that in the federal government and in the OIGF, rules of business were clear. He referred to the provincial legislations which all provinces followed in forest manual volume-II and the section of forest act 1927, Article 4(A) i.e. rules to be framed by federal government on movement of timber across the customs frontier. He added that the task could be assigned to any ministry based on the decision to be made by the government. He explained that the office of IGF had always acted as the service provider to the provinces even before the 18th amendment.

Mr. Shaukat Yousafzai, Additional Secretary Environment, KP welcomed the role of federal government and insisted that it should take the lead role in providing the rightful shares of each province.



Decisions of UNFCCC COPs (Cancun to Warsaw)

A presentation on the important decisions of the Conference of Parties (COPs) on (i) Measurement, Reporting and Verification (MRV), (ii) Forest Reference Emission Levels and Forest Reference Levels (FREL/FRL), (iii) National Forest Monitoring System (NFMS) in the context of implementation of REDD+ activities was given by Dr. Shahzad Jahangir from Climate Change Division (CCD). Main points of the presentation were:

- Decision 4/COP.15, (Copenhagen 2009), provided the methodological guidance for activities relating to REDD+
- Decision 1/Cop.16, (Cancun Agreement 2010), provided the policy approaches and positive incentives on issues relating to REDD+
- Decision 12/COP.17, (Durban 2011), provided the guidance on systems for safeguards / modalities of FREL
- Decision 11/COP.19, (Warsaw 2013), provided the modalities for National Forest Monitoring System (NFMS)
- Decision 14/COP.19, (Warsaw 2013), also provided the modalities for measuring, reporting and verifying (MRV)

Detailed presentation on these decisions is in annexure III(c).

Question and Answers-Discussion

Mr. Hakim Shah Director Forest Education, Pakistan Forest Institute (PFI) raised his concern about the difference in terminologies being taught at PFI and the ones being used for REDD+. In response to his query, Syed Mahmood Nasir referred to the forest manual-II for guidance on the legal procedures and for including the new terminologies in the practical field. He also suggested review of the forest manual-II and changes according to the new terminologies needed for REDD+.

Background and Current Status of REDD+ in Pakistan

Presentation was delivered by Mr. Aurangzeb Ashraf Awan, from CCD. Key points of the presentation were:

- Background of REDD+ in Pakistan
- Definition of REDD+, It is about paying the developing countries in the form of performance based positive incentives or payments
- Eligible activities under REDD+ that include:
 - I. Reducing emissions from deforestation
 - II. Reducing emissions from forest degradation
 - III. Conservation of forest stocks



- IV. Sustainable forest management
 - V. Enhancement of forest carbon stock
- Phased Approach of REDD+ include three phases
 - REDD+ pre-requisites under Cancun agreement that include:
 - I. A National Strategy or action Plan
 - II. National Forest Emission Reference Level/National Forest Reference Level
 - III. A Robust and Transparent National Forest Monitoring System
 - IV. A system to ensure Safeguards
 - Progress of REDD+ in Pakistan which include REDD+ capacity building programme

Question and Answers-Discussion

Mr. Shaukat Yousafzai, Additional Secretary Environment, KP complained that participation of PFI had always been ignored in the trainings on REDD+. He added that despite of the fact that KP Province had the largest area under forest cover Forest Officers of KP had been provided less opportunities of training. He told that they were serious in the process of REDD+ and they had arranged four trainings on REDD+. The office of IGF was further requested to make nominations of their relevant officials for the national as well as international trainings in future.

In their response, Syed Mahmood Nasir (IGF) clarified that according to the official rules and as per orders, office of IGF could only send a request to Additional Chief Secretary of KP and unfortunately, in the past, they had nominated people often from livestock and Planning Commission departments instead of relevant forest officials. The Assistant Inspector General of Forests (AIGF) however ensured that the point would be duly noted and would be taken care of in future.

Provincial Presentations on REDD+

Focal persons of REDD+ from the different provinces gave the status of REDD+ in their respective regions.

Status of REDD+ in AJK

From Azad Jammu and Kashmir (AJK), Mr. Abdul Rauf Qureshi shared the update of REDD+ with the participants. According to him due to financial crisis no initiative could be taken with respect to REDD+ in AJK. Even the regular projects of forestry were affected.

According to him some of the activities which had been initiated and could be helpful for REDD+ in future were:

- I. Forest policy drafted and under the process of approval.
- II. Forest Management Plans; work started on the preparation of these plans for all the forests in AJK but again it was affected due to financial constraints.



Status of REDD+ in KP

From KP, Mr. Shabir Hussain gave the status of REDD+. He said that KP had a total area of 7.45 million ha, out of which 1.52 million ha area was under the forest, which constituted about 42% of the national forest resource. For which the Government of KP was seriously working to conserve the valuable resource. The Government recently embarked upon a massive programme under Green Growth Initiative that was announced on Feb 09, 2014 in Peshawar. As per this programme:

- By 2018, an additional 2% area will be brought under forest by planting 30,000 ha area annually outside designated forests
- About 45 million seedlings will be planted through massive community programme that will divert pressure of fuel wood to farmlands
- About 2,7000 ha of forests will be enriched and will be closed to boost regeneration, due to which 07 % of degraded forests will stand rehabilitated
- REDD+ will be promoted as a source of conserving forests and distribution of benefits will be promoted from standing trees instead of liquidation of resource.
- Environmental services of forests will be assessed to support payment by lower riparian

According to Mr. Shabir Husain, the Government of KP had certain leverages like Pakistan Forest Institute and the biggest forest resource of the country and the Government had been contented with the accommodation of two projects of about Rs. 65.2 million in its annual development plan. He said that they had also put up a working group under the chairmanship of Malik Amin Aslam for the Green Growth Initiative Program where main focus would be given to Forestry and Protected Areas and a substantial work would be done in the next five years.

According to the KP focal person for REDD+, following are the activities which have been planned under REDD+:

- A reference level will be set up as a Base line
- MRV system will be developed
- Proper monitoring system will be developed
- REDD+ strategy will be developed which will include:
 1. System of equitable sharing of benefits
 2. System of environmental and social safeguards
 3. Estimation of carbon stock through tier 1 of IPCC methodology, and by June, 2014 KP Government will be able to assess entire carbon stock through this



methodology. After that international bidding will be done and potential investors will be invited for the carbon credits

4. Piloting of REDD+ by 2017, and two pilot areas have been selected, one in Kaghan and another in Siren
5. Massive Plantation Programme will be started and completed till 2018

At the end he also stated that KP Government had already done negotiation with WWF – Pakistan and IUCN to put up a proper system of monitoring under which one would be for the Green Growth Initiative and other for reference point for the carbon stock assessment.

Status of REDD+ in Gilgit Baltistan

REDD+ focal person from GB, Kamran Hussain gave the updates:

- Notification of Provincial REDD+ Focal Person and establishment of REDD+ Cell
- Approval of PC-I amounting Rs. 30 million on REDD Readiness (total release received by March 2014 Rs.3.500 million)
- Appointment of GIS Specialist/establishment of GIS Lab
- Request is placed to Climate Change Division for developing TORs for hiring consultants to conduct carbon inventory, develop MRV and review forest laws, rules and regulations
- Organized 5 valley conferences of owner communities in Diamer District on REDD+ as well as capacity building of Departmental Staff is also done which include 05 local and 04 international workshops in Nepal, Bhutan, South Africa, Malaysia and USA
- Close Coordination with Climate Change Division and other relevant organizations

Way Forward of REDD+ in GB

- Awareness and Capacity Building of Owners Community and Government officials
- Carbon Stock Assessment
- Amendment in Existing Forest Rules & Regulations
- Development of provincial REDD+ Strategy
- Enhance Coordination with National & International Organizations
- Development of Monitoring, Reporting and Verification (MRV) Mechanisms
- Facilitate Involvement of Voluntary Market
- Initiation of Pilot Projects

At the end he talked about certain issues regarding REDD+ like lack of clearly defined roles of the federal as well as provinces in the context of REDD+, lack in required skills and capacities in implementing the programme and possible financial and technical support. He also updated the participants that the revision of forest policy in GB was in progress and would be completed in two months with REDD+ incorporated. GB forest department was



also working on the working plan of private forests and would be completed in a couple of months.

Status of REDD+ in Balochistan

From Balochistan, Mr. Ghulam Muhammad, Chief Conservator Forest gave the update on REDD+:

- Establishment of REDD+ cell in the forest department
- Revision of Wildlife Law that has been passed by the provincial assembly and now lying with the Governor for final signature
- Revision of Forest Law and Policy is under process which will accommodate not only REDD+ but will also include Man and Biosphere, community and participatory forestry approaches
- One of the most important acknowledgment of Balochistan Forest Department is that the International Coordinating Council (ICC) of the Man and Biosphere (MAB) Programme has declared Juniper Forest of Ziarat as the Man and Biosphere Reserve, the second Biosphere Reserve after Lal Suhanra which will certainly contribute to REDD+ in future
- Balochistan forest department is also working with WWF-Pakistan and KP Government for the Chilghoza Conservation Programme that would also be a future venture for REDD+

At the end, IGF informed the participants that a few years ago when Balochistan Government started working on the revised forest law they included REDD+ and also accepted carbon as forest commodity or minor forest produce. He requested Chief Conservator to share the draft with other provinces so that they could work on the same lines according to their circumstances.

Status of REDD+ in Sindh

From Sindh, Mr. Abdul Sattar Khattri, REDD+ Focal person, gave a brief on the status of REDD+. He gave an account of the total forest area in Sindh. According to him the total area of Sindh has 14.09 million ha out of which 7.21 % is under forest cover including Riverine Forest, Irrigated Plantations, Mangrove, Range land and Barren land. Regarding status of REDD+ in Sindh he gave the following update;

- Establishment of REDD+ cell/unit
- Preparation of projects like study of Master Plan and some other projects under Research and Development Schemes that will actually incorporate some components of REDD+



- Revision of Forest Act with the assistance of WWF (revision of Forest Act is actually the initiative of WWF throughout Pakistan) in which some provisions will be made about the rights of local people
- Sindh Forest Department has also signed agreement with Merlins Wood and proposal has been sent to Chief Minister. For this purpose about 50,000 ha area under the forest cover will be assigned throughout the province

According to him Sindh Forest Department is fortunate in the way that it has piece of coastal area near Karachi and Thatta which constitutes a major carbon sink and the problems of deforestation and degradation are not as intense as in terrestrial area. He also informed that under the lease policy Sindh Forest Department was leasing out the land and political leaders were more anxious to get forest land under lease. So lease policy was a major threat in the province for REDD+.

At the end he said that Master Plan was the initiative of Sindh Forest department. It has been launched and department was in the process of appointing the consultant, which would enable the Sindh Forest Department to get the accurate figures under forest cover in each category.

Question and Answers-Discussion

Secretary Forest and Wildlife Balochistan enquired from the representatives of the provinces if there were any changes in the conventional methodologies and principles in the context of REDD+ in their respective provinces.

Mr. Abdul Sattar Khatri (REDD Focal Person- Sindh) suggested that deforestation and forest degradation could not be stopped if local communities were ignored in the whole process of REDD+. For that purpose the government of Sindh had taken a step to change the policy and to revise the existing Forest Act awaiting approval by the law department. The revised act focused the rights of local people as a step for bringing a positive change.

Responding to a question regarding the progress on the revision of forest law and policy in Sindh Mr. Abdul Sattar Khatri informed the participants on the importance of transparency of the whole process to avoid corruption, which was the main focus of his department.

Presentation on National Forest Monitoring Systems for REDD+ (NFMS overview, the Monitoring Function and the MRV Function)

MRV Function of REDD+

According to Ben Vickers, MRV function of REDD+ include;



Step 1: Measurement of emissions through IPCC equation for emission estimates will be done by **estimate of emissions=activity data** (Area change data from satellite or remote sensing) **x emission factor** (Forest carbon stock change data from National Forest Inventory)

Step 2: Compile into a **National GHG Inventory Report** (emissions from all sectors) and then report the inventory to UNFCCC through the National Communication

Step 3: The UNFCCC organizes the **Verification of the data reported in the inventory**

The purpose of MRV for REDD+ is to assess the performance of REDD+ activities in mitigating greenhouse gas emissions that contribute to climate change. It will be fully operational in phase 3 of REDD+.

IPCC guidance and guidelines for GHG inventories will support the development of GHG inventories that will be:

- Transparent
- Documented
- Consistent over time
- Complete
- Comparable
- Assessed for uncertainties
- Subject to quality control and assurance
- Efficient in the use of resources available to inventory agencies

In which uncertainties are gradually reduced as better information becomes available
Detailed presentation is in annexure III (d).

Question and Answers-Discussion

Mrs. Urooj Saeed (WWF-Pakistan GIS Lab Lahore) asked about the recommended time period to be considered for setting Reference Emission Level i.e. whether it would be 20 or 30 years. Ben Vickers responded that there was no set rule yet, but since FCPF was piloting Reference Emission Levels under different countries they had taken 10 years as the period for each temporal analysis keeping in consideration that the end of the period should not be more than 3 years before the start of the current period. He clarified that FCPF approach was just one of many potential approaches and in next 3 or 4 years there would be more guidance on FREL development as many countries were trying different methods which will be assessed by the panel of experts appointed under the UNFCCC. Ben further added that National Forest Inventories, which are one pillar of a country's MRV system, are usually carried out no more



than once every 5 years, and often less whereas demonstrating performance against FRELS will be reported to UNFCCC every two years.

Dr. Ghulam Akbar (Senior Director Programmes, WWF-Pakistan) asked whether fruit orchards could be considered in the category of forests and how different countries dealt with that. Mr. Ben Vickers replied that that depended on the national decision and Pakistan was to decide on it. He also referred to the experience of other countries where fruit orchards were not included in the forests. Syed Mahmood Nasir (IGF) explained that the farmlands and manmade plantations fell under two different categories of Clean Development mechanism (CDM) in Kyoto Protocol- Article 12 i.e. afforestation and reforestation. He suggested that if one could fulfill the requirements of their definitions only then he could include the orchards under any of the above mentioned categories. He added that in the context of the national circumstances the provinces should timely inform the National Focal Point (NFP) about any consideration of orchards as part of REDD+.

Dr. Ghulam Akbar also asked about clarification regarding the national definition of forest. Syed Mahmood Nasir told that there was an agreed definition of forest in 2004-05, for CDM, however the Punjab government did not approve that. Dr. Ghulam Akbar also stressed for resolving the matter and suggested that Pakistan has to come with unanimously agreed definitions.

Dr. Shahzad Jehangir also suggested that REDD+ and CDM are very much parts of the national policy approved by parliament in 2012 so it would be helpful to go through that document for defining the criteria.

Mr. Irfan Akhtar (Assistant Manager SUPARCO) asked about the categories of the land classes, under REDD+, defined in IPCC guidelines, whether they were consistent with the 36 Land Cover classes categorized by FAO in Land Cover Classification System (LCCS). Ben Vickers clarified that LCCS (and the 36 land cover classes therein) is indeed recommended by FAO as the basis for assessing land cover changes, and thus for creating Activity Data in an MRV system for REDD+. Countries are however free to subdivide the basic six land cover classes (Forest, Cropland, Grassland, Wetland, Settlement, Other) according to national circumstances - they do not have to follow the forest categories used in the IPCC guidelines for Tier 1 carbon stock estimates.

Ms. Urooj Saeed also asked that if the categorization was so important, then for taking 10 years period, if one was dealing with the change in density level along with the change in the forest types then how to categorize the forest? Ben Vickers explained that the categorization allowed to record deforestation. However in that case as the forest was remaining in the forest land but there was a change in the density as well as forest types, so we could calculate forest



degradation by segregating into high density forest, medium density forest and/ or low density forest.

Introduction to National Forest Monitoring System Action Plan

Mr. Ben Vickers gave the introduction to National Forest Monitoring System Action Plan which includes the following outline:

- Objectives of the National Forest Monitoring System Action Plan
- Examples from other countries
- National Forest Monitoring System Action Plan Template
- Tasks for Discussion Groups
- Next Steps

Detailed presentation is in annex III (e).

Question and Answers-Discussion

There was a question from the participants that whether the plantations came under REDD+ or not. Ben explained that according to UNFCCC rules and guidelines plantations were included under REDD+. Although the debate was going on over the years it was agreed that the plantations that remained under forest category were dealt as forests. He referred to the point mentioned by the IG forests that there was already a mechanism in UNFCCC which could address plantations and sequestration of GHG under CDM. So it depended upon the respective country to decide even for including the afforestation in the REDD+ strategy.

Mr. Irfan Akhtar asked a question regarding the effect of evolution of technology on the consistency of the methodology for remote sensing and if the work involved a change in the resolution/sensor of satellite imagery. Ben Vickers ensured that it was not a problem until one was attaining the required information He emphasized potential implications of changing from one technology to another. He added that the parameters/ categories were more important than the image resolution for being consistent in the time period and the demonstrating performance in REDD+ does not require pinpoint accuracy but reliable estimates.

Group work and presentations

After the presentation by Ben Vickers in which he discussed in detail the template of NFMS/MRV action plan, the participants were divided into three split groups depending upon their expertise and interest. Ben Vickers briefed them about the objectives of split groups and their discussion points. These split groups gave their inputs on the following sections of action plan according to the questions that were asked:

1. Institutional arrangements for Pakistan's National Forest Monitoring System, linking existing institutions and data sources (as outlined in the R-PP document)



2. Remote sensing and GIS for forest monitoring – activities, gaps and needs
3. Pakistan's National Forest Inventory – activities, gaps and needs

At the end of their discussions each individual group presented its work through their reporters.

Presentation by Group 1 (Institutional arrangements for Pakistan's NFMS)

Members of the Group

- Mr. Saadullah Ayaz
- Mr. Ghulam Muhammad
- Dr. Ejaz Ahmad
- Dr. Ghulam Akbar
- Mr. Abdul Sattar Khatri
- Mr. Inamullah Khan
- Mr. Sulaiman Khan
- Mr. Woolfgang Hesse

1. Which are the institutions in Pakistan relevant to National and or Provincial Forest Monitoring Systems?

According to the group following are the institutions in Pakistan that are relevant to National or Provincial Forest Monitoring Systems:

- Climate Change Division (CCD)
- Pakistan Forest Institute(PFI)
- Provincial Forest Departments
- GCISC
- SUPPARCO
- Universities
- IUCN
- WWF-Pakistan

2. How is forestry activities currently monitored in Pakistan?

Monitored at Provincial Level

- Through manual Survey of Forest
- Use of Geographic Information System (GIS)

3. What are the capacities needed for Forest Monitoring System (Human, Technical, and Financial)?



According to the group the capacities that will be needed for the National Forest Monitoring System will be assessed in detail (this portion will be covered in the Capacity Need Assessment for NFMS).

Presentation by Group 2 (Remote Sensing and GIS for Forest Monitoring)

Members of the Group

- Irfan Akhter
- Maqsood Ahmad
- Kifayat Ullah
- Abdul Ghaffar Khan
- Jami Ahmad
- Urooj Saeed
- Ali Haider
- Ejaz Ahmad
- Fida Hussain

1. What Satellite, GIS, and Remote Sensing data does Pakistan have or have access to?

National Level

Land sat 8, Spot 5 (2.5m), ASTER, SRTM, ASTERDAM, Topographic sheets (1:250 k & 1:50 k), Atlas of Pakistan (PFI, 2012), FSMP (1992), NFRRAS (2006,07), Administrative boundaries, Survey of India Topographic Maps (1870's).

Provincial/Localized Data

ALOS, Quick bird, Spot, Geoeye, Orbveiw, Pleaicles, PERI (KPK 1998), NRM database (2013), LCCS (Sindhi & Punjabi, SUPARCO ongoing), NFA (52 Districts, LS Maps WWF 2014), NEIMS, Aerial Photographs (1952, 1962), PRISM

2. What reference maps and data are available for land use classification and land use change monitoring?

All the above mentioned data and studies as well as.

- Working Plans, History Files, Stock Maps.
- Revenue Maps, Boundary Pillars (State and Private lands).
- Survey data of various sites available at different organization such as SUPARCO, Forest Department, WWF-Pakistan etc.



3. What are the Current Capacities to analyze the GIS/ Remote Sensing data?

Institutional Capacities

- PFI
- WWF-Pakistan
- SUPARCO
- SOP
- KP Forest Department
- NARC
- WASA
- Urban Units

Technical Capacities

- Basic GIS and Image Processing
- Advance GIS and Image Processing
- Image classification (ISO data, Pixel based, sub Pixel and image based)
- Ortho-rectification, Atmospheric correction Web GIS (mobile GIS, Online Inventories)
- Modeling Techniques

4. Which GIS/ Remote Sensing tools and software could be used to improve data and data analysis and what are their pros and cons of these tools and software?

The group mentioned the following tools that could be used to improve data and data analysis:

- ERDAS Imagine
- ARCGIS
- ENVI
- ER Mapper
- Ecognition
- DGPS

Generally ERDAS Imagine, ARCGIS, ENVI are available in most of the organizations. But over the last year, Ecognition has been proved to be best for forest mapping and roadsides Plantations.

Presentation by Group 3 (Pakistan's National Forest Inventory)

Members of the Group

- Hakim Shah (DFE/ DG, PFI)
- Abdul Rauf Qureshi (CF, AJK)
- Malik Nisar (CF, AJK)



- Gulzar Rehman (Silviculturist, PFI)
- ChoudharySuleman (DFO, AJK)
- Kamran Hussain (GBFD)
- Irtaza Qureshi (DFO, AJK)
- Faiza Lodhi (WWF-Pakistan)

1. National Definition of Forest in Pakistan

The group presented the following definition of forests:

“Forests are the areas which cover at least an area of 0.5 hectares with at least 10% of the tree cover with trees not less than 2 meters”.

2. History of National Forest Inventory in Pakistan

Forest inventories in Pakistan have been carried out for each designated forest located in a specific area since 1948. They are mainly done on the basis of compartments allotted to a specific working circle based on species. In view of the country’s problems relating to forest resources, including the difficulty of meeting fuel wood and timber demands, the Government decided to prepare a Master Plan for Forestry Development, covering the 25-year period from 1993 to 2018. This constitutes the latest forest assessment at national level based on Satellite Imagery interpretation and Field work. The interpretation was done in 1990/91 using 54 Land Satellite Images at a scale of 1:250,000 covering the whole Pakistan. The image quality was acceptable except for mountainous northern region. Sparse coniferous forest was not distinguishable from scrub forests; therefore of a total of 7.04 million hectare of Northern Areas about 4.7 million hectare remained unclassified. In 2004 National Forest and Rangeland Resource Assessment was carried out by the Pakistan Forest Institute.

National Forest Inventory design

A complete national inventory of forest growing stock is not available. Within the Forest Sector Master Plan (FSMP) it was possible to compile data for 1.3 million ha area of working plans in several provinces (29 in KP Province, 3 in Punjab and 4 in AJK) as well as 3 working schemes in Northern Areas. Species-wise composition and estimates of growing stock of coniferous forests was also performed. The sampling design most commonly used for inventories in forest divisions is simple random sampling with a sampling intensity of 0.01%. These inventories, if funds are available, are generally performed every ten or more



years. A tree growth inventory of farm lands was also conducted in KPK and Punjab in 1992 by PFI.

Latest inventory has been conducted by PFI “Land Cover Atlas of Pakistan” using SPOT 5 2.5 meter resolution covering 154 districts.

3. Are there any growth models and what are these models in Pakistan?

- Working Schemes/ Working Plans
- Yield Tables for Irrigated Plantations and Chir Pine Forests managed under Uniform Shelter Wood System

But the group revealed that there is no model for estimating the carbon based growth in the country.

4. What are the various options for National Forest Inventory in Pakistan (with their pros and cons)?

- Full Enumeration – simple, accurate but costly and time consuming
- Sampling - quick, near to accuracy, low cost , require well trained personnel
- Satellite Based – reliable, highly technical, costly but quick

5. What are the existing capacities for NFI and what capacities are needed (human, technical, financial)?

Existing Capacities

- Human capacities exists for field based inventories
- Technical Skills for Data processing and Data propagation skills are weak
- Financial Capacities are weak.

Concluding and closing session

Follow up steps by Ben Vickers

Mr. Ben Vickers informed the participants about the follow up steps and actions. He said that the presentations were very comprehensive and needed more time to discuss and develop proper understanding. However, he tried to cover the essential parts to enable the participants to understand the UN-REDD manual and guidelines on NFMS. He suggested the participants to read the book provided to them both in hard and soft forms. As a follow up he got the consensus of the house to carry forward the Working Group developed for the MRV during the



previous phase of REDD+. The MRV/ NFMS working group would be reactivated and its meetings would be held to discuss and provide input for developing the NFMS action plan. He suggested organizing at least a couple of meetings during May-June 2014.

Closing remarks by the IGF

Syed Mahmood Nasir, Inspector General Forests, concluded the workshop with the following remarks. He said “It was a very demanding and a very constructive day. When we came here, we were in a different frame of mind and now when we are leaving we are much more educated. Maybe we are coming to know things which we already knew but were not aware of them.”

Syed Mahmood Nasir also highlighted the importance of biodiversity and social safeguards that needed to be worked on more in the future. He also ensured that his team would keep on serving to develop the coordination and capacity building on REDD+, as the ultimate role to conserve the forests of Pakistan. He ensured that nothing would be done in REDD+ on the cost of women and poor people whose livelihoods were dependent on the forests.

He reminded that the REDD+ process in Pakistan had entered in its 3rd year and that Pakistan had a good history in the field of forestry in comparison to many developed countries. He highlighted the importance of natural ecosystem of Pakistan forests and mentioned the role of professional foresters to develop forestry in the country.

Workshop’s Recommendations:

1. To synchronize and remove the difference in terminologies being taught at PFI and other academic institutions and the ones that are used for REDD+, it was recommended to review the forest manual-II and make changes according to the new terminologies needed for REDD+.
2. Relevant officials of the provincial forest departments should be given equal opportunities of national and international trainings on REDD+. Though nomination letters are sent to the Additional Chief Secretaries, it will be explained in the letter who should be nominated for the trainings.
3. The presentations on the NFMS required at least two days however, it was agreed and recommended that the participants would be given hard and soft copies of the resource material and literature to educate them about the NFMS. Moreover, anyone who had difficulties in understanding or had some queries about the NFMS should contact Ben Vickers or the REDD+ project team.
4. As the Balochistan Government has included REDD+ and has also accepted carbon as forest commodity and minor forest produce in its revised forest law Mr. Ghulam



Muhammad Chief Conservator would share the draft forest act with other provinces so that they could work on the same lines according to their circumstances.

5. In the context of the national circumstances the provinces should timely inform the National Focal Point (NFP) about any consideration of orchards as part of REDD+.
6. The national definition of forest would be unanimously agreed in consultation with all provinces and territories. The national definition for forest could be agreed in line with the criteria recommended by the national policy approved by the parliament in 2012. The split group recommended the forest definition to be considered i.e. “Forests are the areas which cover at least an area of 0.5 hectares with at least 10% of the tree cover with trees not less than 2 meters”.
7. Identification of capacity gaps and needs for NFMS could not be done during the group work due to limited time. It was decided to do it during NFMS working group meeting and the Capacity Building Need Assessment study by the consultant.
8. Over the last few years remote sensing software “Ecognition” has been proved to be the best for forest mapping and roadsides Plantations. The split group on GIS and Remote Sensing recommended using this software to improve data and data analysis.
9. Though growth models for timber and biomass are available for certain species and areas in the form of yield tables, however there no models for carbon growth, which need to be developed.
10. Regarding National Forest Inventory though human resources exist for field based inventories but their technical skills especially for data processing and data propagation are weak. Moreover financial capacities are also weak. The split group recommended filling of these gaps for developing and implementing a National Forest Inventory and National Forest Monitoring System.
11. Regarding the status on REDD+ preparedness in provinces mentioned by the provincial focal persons, it can be concluded that GB and KP have made quite good progress and they are quite ahead of AJK, Balochistan, Sindh and Punjab. In almost all of the provinces there are REDD+ cells notified and focal persons appointed. In GB and KP they have their own approved projects for REDD+ readiness at the sub-national level. However it was agreed and recommended that the provinces should follow and adopt approved standards and methods to ensure compatibility at national and international levels.



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Annex I

NEMS - W-Shop

WORKSHOP SIGN-IN SHEET

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NFM S - W. Shop.

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NFMS Workshop

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46	Dr. Faizul Bari	NRM Consultant	FAO	-	-	[Signature]
47	Patrick Eusew	FAO	FAO	-	-	[Signature]



Annex II

Pakistan's National Forest Monitoring System for REDD+: Action Plan Consultation Workshop

FAO Office NARC Premises, Chak Shahzad, Islamabad 20th March 2014

Time	Presentation Title / Activity	Presenter / Notes
08.30-09.00	Registration of participants	WWF-Pakistan's team
09.00-09.10	Opening remarks	Syed Mahmood Nasir, Inspector General Forests
09.10-09.20	Introduction to workshop	Muhammad Ibrahim Khan Sr. Manager Conservation, WWF-Pakistan
09.20-09.40	The international context of REDD+	Ben Vickers, UN-REDD/ FAO Regional Office for Asia-Pacific
09:40-10:00	Government's policies and priorities on climate change and forests	Raja Hassan Abbas, Secretary, Climate Change Division
10.00-10.15	Decisions of UNFCCC COPs (Cancun to Warsaw)	M. Irfan Tariq, NFP UNFCCC / Representative of Environment Wing
10:15-10:30	Forests, climate change & future REDD+	Saman Ikram, Yale School of Forestry and Env. Sciences
10.30-10.45	Current status of REDD+ in Pakistan: National presentation	Aurangzeb Ashraf Awan Asstt. Inspector General Forests
10:45-11:30	Provincial presentations on REDD+	KP/GB/Punjab/Sindh/Balochistan/ AJK
11.30-12.30	National forest monitoring systems for REDD+: NFMS Overview, the Monitoring function and the MRV function	Ben Vickers, UN-REDD/ FAO Regional Office for Asia-Pacific
12:30- 13:30	Lunch	
13:30-14:00	Introduction to National Forest Monitoring System Action Plan	Ben Vickers, UN-REDD/ FAO Regional Office for Asia-Pacific
14:00-15:30	Discussion groups:	



	Inputs on sections of the NFMS/ MRV Action Plan	
	<ol style="list-style-type: none"> 1. Institutional arrangements for Pakistan’s National Forest Monitoring System, linking existing institutions and data sources (as outlined in the R-PP document) 2. Remote sensing and GIS for forest monitoring – activities, gaps and needs (facilitated by WWF-Pakistan GIS unit) 3. Pakistan’s National Forest Inventory – activities, gaps and needs 4. Pakistan’s national GHG inventory and UNFCCC reporting – activities, gaps and needs (facilitated by DG Env./ Global Climate Impact Study Center) 	
15:30-15:45	Tea Break	
15:45-16:15	Presentations from groups and Q & A	
16:15-16:45	National Forest Monitoring System Action Plan: Summary of recommendations and next steps Ben Vickers, UN-REDD/ FAO Regional Office for Asia-Pacific	Ben Vickers, UN-REDD/ FAO Regional Office for Asia-Pacific
16:45-17:00	Closing remarks	Syed Mahmood Nasir, Inspector General Forests



Annex III (a)

An overview of the REDD+ process in Pakistan and Introduction to the workshop

Pakistan's National Forest Monitoring System for REDD+:
Action Plan Consultation Workshop
20th March 2014

Muhammad Ibrahim Khan WWF-Pakistan

Initial national consultation and sensitization workshops on REDD+ (2009-2012)

1. Workshop on Capacity Building for **Development and Implementation of Carbon Finance Projects in Pakistan** (Nov. 2009, Islamabad, supported by World Bank and Winrock International)
2. Workshop on **Climate Change Mitigation and REDD+** (September 2010, Islamabad in collaboration with the Swiss Government).
3. **Capacity Building workshop on REDD+** (October 2011, Islamabad in collaboration with civil society organizations)
4. Workshop on **Social and Environmental Principles and Criteria for REDD+ Safeguards** (January 2012, Islamabad in collaboration with Sustainable Land Management Project (SLMP))
5. National workshop on **procedures for financing implementation of REDD+ under the Cancun Agreement** (24th February 2012, Islamabad)

The REDD+ Project: Preparedness Phase for Pakistan (2012-2013)

- ▶ Funded by the One UN JPE
- ▶ Overall guidance by the OIGF and implementation by ICIMOD and WWF-Pakistan
- ▶ Duration: May 2012 to Oct 2013
- ▶ Goal: **Initiation of REDD+ preparedness phase in Pakistan** that will lead to developing the national REDD+ strategy
- ▶ Objectives:
 - ▶ Awareness raising and capacity building of stakeholders in REDD+ concepts and the pre-requisites for implementing REDD+ program
 - ▶ Identification of capacity needs of stakeholders in the context of REDD+ in Pakistan.
 - ▶ Preparation of a **full-scale national REDD+ project proposal** and submit to donors for funding

Support and follow-up activities for the REDD+ Readiness Roadmap process in Pakistan (2013)

- ▶ Funded by FAO under the UN-REDD TS
- ▶ Overall guidance by the OIGF and implementation by ICIMOD and WWF-Pakistan
- ▶ **Duration:** Jan 2013-Dec 2013
- ▶ **Goal:** To prepare Pakistan in proceeding with REDD+ Readiness activities at the national scale.
- ▶ **Objective:** To develop Pakistan's REDD+ Readiness Roadmap based on sound technical foundations and multi-stakeholder consultations

Major achievements of the projects

- ▶ **17 workshops conducted** at district, provincial and national levels following a systematic consultation and participatory process
- ▶ A draft **Readiness Preparation Proposal (R-PP)** for Pakistan developed;
- ▶ An **analytical document compiled** on the major drivers and causes of deforestation and forest degradation
- ▶ Major **stakeholders identified** for future REDD+ programs
- ▶ A **critical mass of the key stakeholders prepared** with basic knowledge, background and requirements on REDD+
- ▶ **Linkages developed** with international organizations, e.g. UN-REDD for technical and financial assistance





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Preparation of Action Plan and Capacity Building for a National Forest Monitoring System (NFMS) for REDD+ (2014)

- ▶ Goal: To prepare Pakistan for proceeding with REDD+ Readiness activities at the national scale.
- ▶ Output 1: National REDD+ NFMS Action Plan, prepared
 - ▶ National consultation workshop on NFMS Action Plan
 - ▶ Mapping of existing MRV capacity, gaps and need assessment
 - ▶ Developing standard methodology for spatial analysis of forest cover change
 - ▶ Assessment of data availability for LULUCF GHG inventory
 - ▶ Draft NFMS action plan (share with provinces and improve)
- ▶ Output 2: Capacities of stakeholders developed for forest monitoring, Greenhouse Gas Inventory (GHG-I) and overall implementation of NFMS Action Plan
 - ▶ Training workshop on satellite forest monitoring system
 - ▶ Training workshop on national system for GHG inventory

National consultation workshop on NFMS Action Plan

Workshop objectives:

1. Orientation of key national and provincial stakeholders on NFMS for REDD+
2. NFMS Action Plan development

Session-1: Setting the stage

- ▶ Introduction to workshop
- ▶ The international context of REDD+
- ▶ Government's policies and priorities on climate change and forests
- ▶ Decisions of UNFCCC COPs (Cancun to Warsaw)
- ▶ Forests, climate change & future REDD+

Session-2: Where we stand (current status of REDD+ in Pakistan)

- ▶ National Presentation
- ▶ Provincial presentations

National consultation workshop on NFMS Action Plan

Session-3: National Forest Monitoring System and NFMS Action Plan

- ▶ National forest monitoring systems for REDD+: NFMS Overview, the Monitoring function and the MRV function
- ▶ Introduction to National Forest Monitoring System Action Plan
- ▶ Discussion groups: Inputs on sections of the NFMS/ MRV Action Plan
 1. Institutional arrangements for Pakistan's National Forest Monitoring System, linking existing institutions and data sources (as outlined in the R-PP document)
 2. Remote sensing and GIS for forest monitoring - activities, gaps and needs
 3. Pakistan's National Forest Inventory - activities, gaps and needs
 4. Pakistan's national GHG inventory and UNFCCC reporting - activities, gaps and needs
- ▶ Presentations from groups and Q & A

Session-4: Next steps and closing

- ▶ National Forest Monitoring System Action Plan: Summary of recommendations and next steps
- ▶ Formal closing

Thanks



Annex III (b)

UN-REDD PROGRAMME

National Forest Monitoring Systems for REDD+

Pakistan's National Forest Monitoring System Action Plan

Orientation Workshop

20th March 2014
Islamabad

UN-REDD PROGRAMME

National Forest Monitoring Systems for REDD+

Pakistan's NFMS Action Plan Consultation Workshop

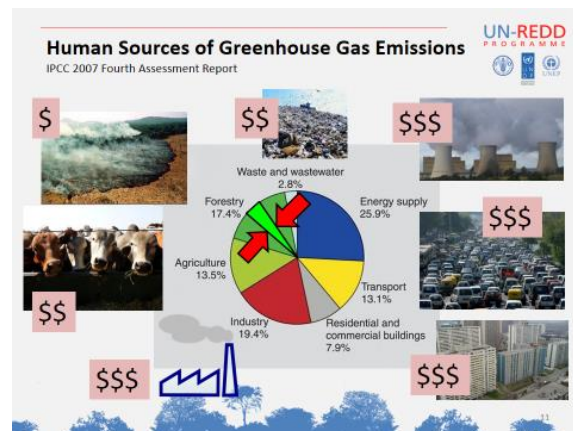
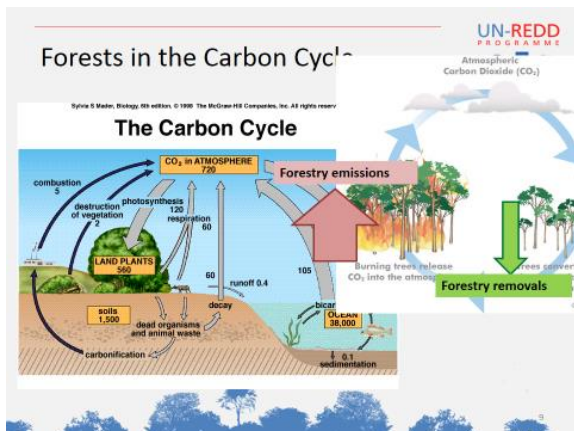
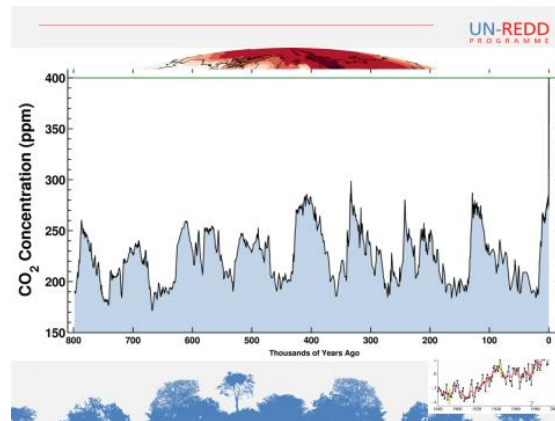
THE INTERNATIONAL CONTEXT OF REDD+

20th March 2014
Islamabad

UN-REDD PROGRAMME

REDD+

THE SCIENTIFIC BASIS





UN-REDD
PROGRAMME



UN-REDD PROGRAMME

REDD+

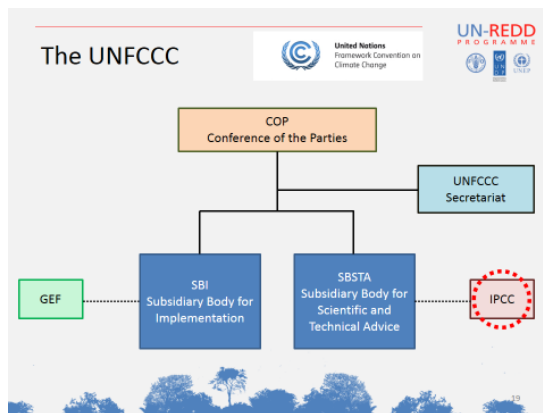
THE POLITICAL BASIS

United Nations Framework Convention on Climate Change

The objective of the UNFCCC: To stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system

The UNFCCC

- Countries who have signed up to the UNFCCC are known as **Parties** and meet once per year as the **Conference of the Parties (COP)** (latest meeting: COP19, Warsaw, 11-22 November 2013)
- Parties are divided into developed and developing
 - Developed countries are known as **Annex 1 Parties**
 - E.g. UK, Germany, USA, Canada
 - Developing countries are known as **non-Annex 1 Parties**
 - Including Pakistan
- Many countries negotiate under the UNFCCC as part of **negotiation groups or blocks** with common interests or circumstances, e.g.:
 - Coalition for Rainforest Nations (CRN)
 - Alliance Of Small Island States (AOSIS)
 - European Union (EU)
- Outcomes of annual COP negotiations are published as **Decisions**





The UNFCCC: Text of the Convention



- The text of the Convention sets out commitments and rules which **all Parties** must follow

Article 4: Commitments:

- 1. **All Parties**, taking into account their **common but differentiated responsibilities** and their specific national and regional development priorities, objectives and circumstances, shall:
 - a) Develop, periodically update, publish and make available to the Conference of the Parties, in accordance with Article 12, **national inventories of anthropogenic emissions by sources and removals by sinks** of all greenhouse gases not controlled by the Montreal Protocol, using comparable methodologies to be agreed upon by the Conference of the Parties

The UNFCCC: Text of the Convention



Article 4: Commitments:

- b) Formulate programmes to **mitigate climate change** by addressing anthropogenic emissions by sources and removals by sinks of GHG gases ... and measures to **facilitate adaptation** to climate change
- d) **Promote sustainable management**, and promote and cooperate in the conservation and enhancement of sinks and reservoirs of GHG gases ... including biomass, **forests** and oceans
- f) **Take climate change considerations** into account ... in relevant social, economic and environmental **policies and actions** ... with a view to minimizing adverse effects on the economy, public health and the quality of the environment

The UNFCCC: The Kyoto Protocol



- The Kyoto Protocol (1997): The first global climate change agreement
- Developed countries had emitted more emissions → therefore they are more responsible for addressing climate change
 - Concept of “**common but differentiated responsibilities**”
- Industrialized countries** (Annex 1 Parties) that have ratified the Kyoto Protocol **committed themselves to reduce their national GHG emissions** → binding targets
 - E.g. The UK committed to reduce its emissions by 7% by 2008-2012, compared to 1990 emissions levels
- Industrialized countries** are given a **list of options to reduce their emissions**, including: enhancement of energy efficiency; **promotion of sustainable forest management, reforestation**; promotion of sustainable agriculture; promotion of renewable energy, taxes on GHG emissions, etc.

The UNFCCC: The Bali Action Plan



- In 2007, there was an overall feeling that the Convention was not fulfilling its role
- Parties met in Bali and decided that 1) **more needed to be done** to tackle climate change (the Bali Action Plan) and that 2) the world was changing rapidly and that **more emissions were coming from developing countries**
- The **focus had previously been on developed countries**, but in Bali it was decided that **developing countries could also contribute** to climate change mitigation:
 - 1 (b) **Enhanced national/international action** on mitigation of climate change, including consideration of:
 - Nationally appropriate mitigation actions by developing country Parties** in the context of sustainable development, supported and enabled by technology, financing and capacity-building, in a **measurable, reportable and verifiable** manner

Nationally Appropriate Mitigation Actions (NAMAs)

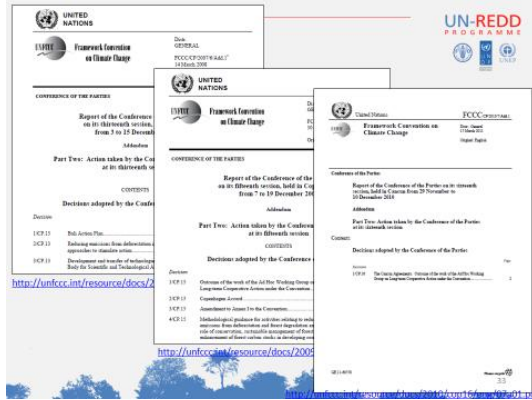


- Under the UNFCCC, all countries are encouraged to implement mitigation activities (to reduce GHG emissions) in the context of **national circumstances**
 - *Nationally Appropriate Mitigation Actions – NAMAs*
- E.g.: If a country has most emissions coming from industry, it should aim to reduce emissions from industry – i.e. “**nationally appropriate**”
 - (In many developing countries, a large proportion of emissions come from the forestry and land use sector...)
- The **Bali Action Plan** encourages all countries to reduce their GHG emissions, according to national circumstances, in a way that is:
 - Measurable** – i.e. you can **measure/estimate** how much you are reducing emissions
 - Reportable** – i.e. you can make an inventory and report your emissions in an **accurate/standardized way**
 - Verifiable** – i.e. you can make your inventory of emissions **available for review**



The International Context of REDD+

THE EVOLUTION OF REDD+



UNFCCC: COP11 – Montreal, 2005

- In recognition of the scale of global GHG emissions from forestry and land use change ...
- The **Coalition for Rainforest Nations**, led by Papua New Guinea and Costa Rica, proposed an agenda item at the 11th Conference of the Parties (COP11) – **"Reduced Emissions from Deforestation in Developing Countries"** (REDD)
 - Coalition for Rainforest Nations <http://www.rainforestcoalition.org>
- Initiated a **2-year process** to gather more information
 - Workshops in Rome (2006) and Cairns (2007) to discuss technical aspects
 - Workshops concluded that:
 - Technology existed to **monitor changes in forest area** using remotely sensed data
 - Methodologies and tools** to estimate emissions from deforestation exist
 - Need robust systems** for measuring, reporting and verifying emission reductions
- REDD emerged in Decision text in 2007 ...

UNFCCC: COP13 – Bali, 2007

- As part of guidance for developing countries on how to reduce their GHG emissions:
- Decision 1/CP.13: Enhanced action on mitigation** including:
 - (b) (ii) **NAMAs** by developing countries, supported and enabled by capacity building, in a **measurable, reportable and verifiable** manner
 - (b) (iii) Policy approaches and policy incentives on issues relating to **reducing emissions from deforestation and forest degradation in developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries**
- Decision 2/CP.13: Reducing emissions from deforestation in developing countries: approaches to stimulate action**
 - Encourages **capacity building, technical assistance & mobilization of resources** for developing countries
 - Encourages parties to explore a range of options to **address the drivers of deforestation**
 - Requests methodological input from **SBSTA**

UNFCCC: COP16 – Cancun, 2010

"Outcome of the work of the Ad Hoc Working Group on long-term Cooperative Action under the Convention"

- Section C: "Policy approaches and positive incentives on issues relating to reducing emissions from deforestation and forest degradation in developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries"**
 - Defined REDD+ for the first time**
- Annex I: "Guidance and safeguards for policy approaches and positive incentives on issues relating to reducing emissions from deforestation and forest degradation in developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries"**

UNFCCC: COP16 – Cancun, 2010

- Developing countries are encouraged to implement **five forestry mitigation activities** (Cancun – Decision 1/CP.16, paragraph 70):
 - a) Reducing emissions from deforestation
 - b) Reducing emissions from forest degradation
 - c) Conservation of forest carbon stocks
 - d) Sustainable management of forests
 - e) Enhancement of forest carbon stocks

} REDD
+

- To be implemented through **policy approaches & positive incentives at the national level**
- Countries can focus on activity/ies most relevant to their **national circumstances**
- Voluntary participation** by developing countries only

ACTIVITY	EXPLANATION	USEFUL INDICATORS
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Cancun REDD+ Decision

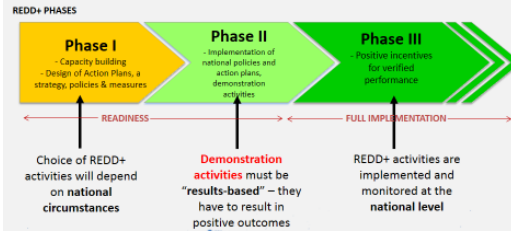


- REDD+ activities should be implemented in accordance with **seven REDD+ safeguards** (actions to ensure no social or environmental harm)
- Countries that choose to implement REDD+ activities should develop the following elements:
 - A **national strategy or action plan**
 - Forest reference emission levels and forest reference levels – RELs/RLs (performance benchmarks)**
 - A **national forest monitoring system**
 - A **safeguards information system** (seven REDD+ safeguards in Appendix 1)
- Countries should address: **drivers of D&D, land tenure issues, forest governance issues, gender considerations and REDD+ safeguards**
- Urges developed country Parties to **financially support developing countries** to implement REDD+

Cancun REDD+ Decision REDD+ Phased Implementation



- Paragraph 73: **Decides** that REDD+ activities should be implemented in **three phases**



Why Implement REDD+ Activities?

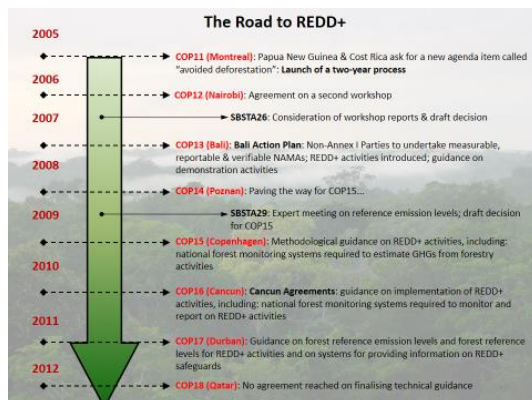


- Contribute to **climate change mitigation** actions by developing countries
 - Part of a post-2020 global climate change agreement
- Provide **incentives** to developing countries for **sustainable forest management**
 - Can be source of support to build technical/practical capacity for forestry
- Support sustainable **local livelihoods** (provide alternatives), **biodiversity conservation** and other **ecosystem services** provided by forests
 - For example: water cycling, soil conservation
- Incentivize cross-sectoral collaboration for long-term **strategic land use planning and development**
 - For long-term productive use of forests: commercial, conservation (tourism), etc.

Progress Since Cancun (2011-2013)



- Durban (2011)**
 - New **climate agreement to be finalized by 2015**; and come into force no later than 2020, which will include REDD+
 - Makes reference to both **market and non-market approaches** to support results-based actions (nothing concrete)
 - MRV will be a pre-condition** to results-based finance
 - Guidance on providing information on **safeguards** and forest reference emission levels and forest reference levels (RELs/RLs)
- Doha (2012)**
 - SBSTA was **not able to complete its work on NFMS and MRV**
 - Issues to be resolved: processes for **verification of REDD+ results and assessment of RELs/RLs; financing**
 - New issues raised for consideration (submission of **safeguards information; drivers of D&D**)



UNFCCC: COP19 – Warsaw, 2013



“Warsaw Framework on REDD+”

Seven decisions on REDD+, designed to provide a complete set of guidance for participating countries to move forward with REDD+ Readiness

- Addressing the drivers of deforestation and forest degradation.
- Work programme on results-based finance
- Modalities for measuring, reporting and verifying.
- Modalities for national forest monitoring systems.
- Coordination of support for the implementation of activities in relation to mitigation actions in the forest sector by developing countries, including institutional arrangements.
- Guidelines and procedures for the technical assessment of submissions from Parties on proposed forest reference emission levels and/or forest reference levels.
- The timing and the frequency of presentations of the summary of information on how all the safeguards...are being addressed and respected.



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UNFCCC: COP19 – Warsaw, 2013



- Addressing the drivers of deforestation and forest degradation.
 - Encourages parties, organisations and the private sector to work to address drivers and to share information
 - Recognises unique national circumstances in addressing drivers
- Work programme on results-based finance
 - Connects RBF to MRV of actions and summary of safeguards information
 - Promotes the Green Climate Fund as a key source of RBF, but as one of many potential sources
 - Establishes an information hub for REDD+ results and corresponding RBF on UNFCCC web platform
 - Requests UNFCCC Standing Committee on Finance to consider ways and means to transfer payments under RBF (so not complete)
- Modalities for measuring, reporting and verifying
 - Requests countries to provide reports through a technical annex to Biennial Update Reports (BURs)
 - Technical Teams of Experts for verification will contain one expert each from developed and developing countries

UNFCCC: COP19 – Warsaw, 2013



- Modalities for national forest monitoring systems.
 - Decides that NFMS should provide data that are transparent, consistent and suitable for MRV
 - Decides that NFMS should build upon existing systems, be flexible, allow for improvement and reflect the phased approach
- Coordination of support for the implementation of activities in relation to mitigation actions in the forest sector by developing countries, including institutional arrangements.
 - Invites interested parties to designate a national focal point or entity for REDD+ issues, to liaise with UNFCCC and potentially to receive RBF
 - Encourages national focal points to meet regularly to discuss lessons and coordinate support
- Guidelines and procedures for the technical assessment of submissions from Parties on proposed forest reference emission levels and/or forest reference levels.
 - Decides that all submissions for RBF under REDD+ shall be subject to a technical assessment (now UNFCCC has to work out how this assessment will be done – guidelines are in an annex)
 - Invites parties and organisations to support capacity building for REL development
- The timing and the frequency of presentations of the summary of information on how all the safeguards are being addressed and respected.
 - Opens a channel on UNFCCC's REDD+ web platform to provide the summary, to coincide with national communications

UNFCCC REDD+ Web Platform



United Nations
Framework Convention on
Climate Change

UNFCCC Google Search

Home | COP | A | CC-Mit | CC-Adp | TT-Clean | Your location: Home > Methods & Science > REDD+ > REDD+ Web Platform

NEGOTIATIONS

Meetings
Documents & Decisions
Bodies

FOCUS

Adaptation
Finance
Mitigation
Technology

PROCESS

Essential Background
Rights-Related
Cooperation & Support
Adaptation
National Reports
GHC Data
Methods & Science
REDD
Methodological Guidance

REDD Web Platform

Welcome to the REDD information sharing web platform.

The COP has invited Parties, relevant organizations and stakeholders to support ongoing efforts, capacity building, information activities and modification of measures relating to reducing emissions from deforestation and forest degradation in developing countries and to share the outcomes of these efforts with the SDCTA by providing corresponding information to the secretariat in accordance with COP-19. The COP also requested the secretariat to develop a web platform where this information will be made available.

The information shared on this web platform can be accessed through three entry points:

- By readiness queries
- By country/organization
- By topic

Parties, relevant organizations and stakeholders are encouraged to submit information relating to reducing emissions from deforestation and forest degradation in developing countries (REDD) to this web platform. Information can be submitted in the form of open text, PDF documents and pictures. Whenever sending PDF documents or pictures it would be appreciated if you also add a short textual description (1-3 sentences).

Please submit information and/or any queries/feedback on this web platform to the following e-mail address: redd_webplatform@unfccc.int or http://unfccc.int/methods/science/redd/redd_web_platform/items/4531.asp

UNFCCC documents relating to REDD, including:
 * Key decisions
 * Working papers
 * Technical papers
 * Submissions

Further information:
 Methodological Guidance
 REDD Finance
 Coordination of Support

Sources of funding for REDD+ Readiness



- Prior to the full national implementation of REDD+, there are various potential sources of funding for countries to building capacity and awareness (*Readiness*)
- UN-REDD Programme
 - <http://www.un-redd.org/>
- World Bank's Forest Carbon Partnership Facility (FCPF)
 - <http://www.forestcarbonpartnership.org/>
- German Government's International Climate Initiative (ICI)
 - <http://www.international-climate-initiative.com/en/>
- European Union's Global Climate Change Alliance (GCCA)
 - <http://www.gcca.eu/>
- Government of Norway's International Climate and Forests Initiative
 - <http://www.regjeringen.no/en/dep/md/selected-topics/climate/the-government-of-norways-international-initiative.html?id=548593>

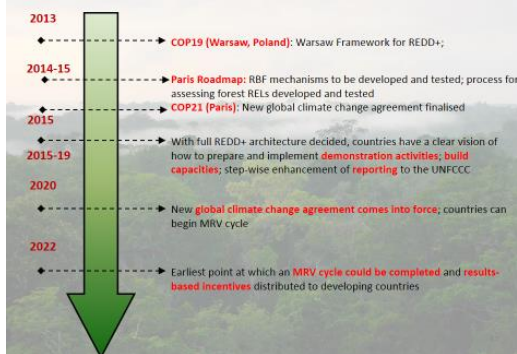
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The International Context of REDD+

KEY ISSUES & CHALLENGES FOR REDD+

The Road to REDD+ ... looking forward





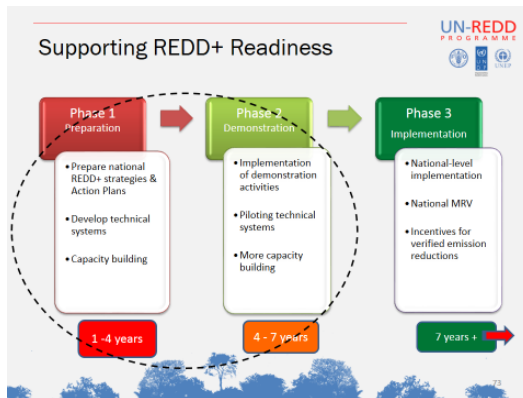
Key Issues for REDD+ For Countries to Consider

- Approaches to REDD+ **policy formulation and implementation**
 - How and where to implement REDD+ activities?
- **Governance** of REDD+ implementation
 - Importance of inter-sectoral and inter-ministerial approaches
 - Linking national processes to local stakeholders
- Methodologies for **forest monitoring** and **transparent data sharing**
- Cost effective and transparent approaches to carbon measurement
- Assessing the **specific drivers** of deforestation and forest degradation → develop policies
- How to implement and provide information on the REDD+ **safeguards**
- Approaches to **distributing REDD+ incentives**
 - Financial, other?

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REDD+ Capacity Building Support

THE UN-REDD PROGRAMME



Countries receiving support from the UN-REDD Programme

FAO in the UN-REDD Programme

- In the UN-REDD Programme FAO supports countries to develop **technical systems for measuring and monitoring forests**
- These systems will help countries **meet international requirements** to participate in REDD+
- Improved data and technical systems can also help countries with **forestry decision making and policy**
- Specifically, FAO supports countries on
 - National Forest Inventories
 - Satellite forest monitoring
 - GHG inventories

Pakistan in the UN-REDD Programme


- Pakistan joined the UN-REDD Programme in **June 2011**
- To date, Pakistan has received support from FAO, via the UN-REDD Programme, on development of a national REDD+ **Readiness Preparation Proposal (R-PP)**, which serves as a Roadmap or guidance document for REDD+ Readiness in Pakistan. The document explains how Pakistan will prepare to implement REDD+ activities under the UNFCCC
- Pakistan's R-PP was approved by the World Bank's Forest Carbon Partnership Facility in December 2013. Pakistan is now a participant country of the FCPF
- Through the UN-REDD Programme, FAO has signed a letter of agreement with WWF Pakistan to support preparation of **Pakistan's National Forest Monitoring System Action Plan** and capacity building for implementation of this plan



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Thank you

Ben.Vickers@fas.gov
<http://www.un-redd.org>



Annex III (c)

Government of Pakistan
Climate Change Division

Important Decisions of Conference of the Parties on

- (i) **Measurement, Reporting & Verification (MRV)**
- (ii) **Forest Reference Emission Levels and Forest Reference Levels (FREL / FRL)**
- (iii) **National Forest Monitoring System (NFMS)**

in the context of implementation of REDD+ activities

M. Irfan Tariq
National Focal Point UNFCCC

Government of Pakistan
Climate Change Division

Decision 4/CP.15 (Copenhagen 2009)

"Methodological guidance for activities relating to REDD+"

Developing countries, for the sake of MRV have to:

- a) Identify DoD and means to address these;
- b) Identify activities that reduce emissions and increase removals
- c) Use IPCC guidance /guidelines for estimating GHG emissions / removals
- d) Establish, according to national circumstances and capabilities, robust and transparent NFMS (if appropriate, sub-national systems)
 - (i) Use a combination of RS and ground-based forest carbon inventory approaches
 - (ii) Provide transparent, consistent, accurate estimates, within national capabilities
 - (iii) Results available for international review

Government of Pakistan
Climate Change Division

Decision 1/CP.16 (Cancun Agreements 2010)

Policy approaches & positive incentives on issues relating to REDD+

Developing countries to develop:

- (71-b) A national FREL /or FRL, (or sub-national on interim basis) with provisions contained in decision 4/CP.15
- (71-c) A robust and transparent NFMS for the monitoring and reporting of the activities referred to in paragraph 70 above, (or sub-national on interim basis) with provisions contained in decision 4/CP.15

Government of Pakistan
Climate Change Division

Decision 12/CP.17 (Durban 2011)

Guidance on systems for safeguards / modalities of RFEL

Developing countries to develop:

- Express in tonnes of carbon dioxide equivalent per year
- Take into account decision 4/CP.15
- Follow step-wise approach to national FREL / FRL
- Sub-national as an interim measure
- Submit voluntary FREL / FRL, in accordance with decision 71(b)
- International assessment of FREL / FRL

Government of Pakistan
Climate Change Division

Decision 12/CP.17 (Durban 2011)

Guidance on systems for safeguards / modalities of RFEL

Developing countries to develop:

- Express in tonnes of carbon dioxide equivalent per year
- Take into account decision 4/CP.15
- Follow step-wise approach to national FREL / FRL
- Sub-national as an interim measure
- Submit voluntary FREL / FRL, in accordance with decision 71(b)
- International assessment of FREL / FRL

Government of Pakistan
Climate Change Division

Decision 11/CP.19 (Warsaw 2013)

Modalities for national forest monitoring systems (NFMS)

- NFMS should take into account the guidance 4/CP.15
- Guided by the most recent IPCC guidance and guidelines
- Robust NFMS should provide data and information that are transparent, consistent over time, and suitable for MRV
 - (a) Build upon existing systems
 - (b) Assessment of different types of forest
 - (c) Flexible and allow for improvement
 - (d) Reflect Phased approach of REDD+
- NFMS to provide information on safeguards (Annex of 1/CP.16)



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Department of Pakistan
Climate Change Division

Decision 14/CP.19 (Warsaw 2013)

Modalities for measuring, reporting and verifying (MRV)

- REDD+ MRV of anthropogenic emissions / removals to be consistent with 4/CP.15
- NAMA MRV in accordance with any future decisions
- Develop REDD+ MRV capacities
- Data / information should be transparent, and consistent over time and with FREL / FRL, in accordance with 1/CP.16, paragraph 71(b) and (c) and 12/CP.17
- Improve the data and methodologies used over time
- Biennial update reports by Parties



Annex III (d)

UN-REDD PROGRAMME

National Forest Monitoring Systems for REDD+

Pakistan's National Forest Monitoring System Action Plan

Consultation Workshop

20th March 2014
Islamabad

UN-REDD PROGRAMME

National Forest Monitoring Systems for REDD+

Pakistan's NFMS Action Plan Consultation Workshop

NATIONAL FOREST MONITORING SYSTEMS FOR REDD+:
Measurement in the MRV System

20th March 2014
Islamabad

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Presentation Outline

- Overview of Measurement, Reporting and Verification for REDD+
- Overview of Measurement in MRV for REDD+ and IPCC key concepts
- Measurement: Assessing Activity Data
- Measurement: Assessing Emission Factors

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Two functions of a National Forest Monitoring System for REDD+

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National Forest Monitoring Systems for REDD+

MRV FUNCTION

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Measurement, Reporting and Verification

- An example from the **transport sector**
- Aim: to estimate greenhouse gas (GHG) emissions from the transport sector
- **Step 1: Measurement** of emissions
 - Number of cars in a country ("activity data") x average emissions per car ("emission factor") = estimate of emissions from cars per year
 - → Trucks, trains, planes, etc...
- **Step 2:** Compile into a **national GHG inventory report** (emissions from all sectors)
 - Report the inventory to the UNFCCC through the National Communication
- **Step 3:** The UNFCCC organizes the **verification** of the data reported in the inventory



MRV for REDD+

The purpose of MRV for REDD+ is to **assess the performance of REDD+ activities in mitigating greenhouse gas emissions** that contribute to climate change

- MEASURE** the emissions and removals (sequestration) of **anthropogenic greenhouse gas emissions** related to forest land
- Make an inventory of these emissions and **REPORT** them to the UNFCCC
- Make the emissions inventory data and methods available for independent **VERIFICATION** by the UNFCCC

Only has to be **fully operational in Phase 3** of REDD+

MRV for REDD+ IPCC Equation for Emission Estimates

The diagram illustrates the IPCC equation for emission estimates. It shows three components: 'ACTIVITY DATA' (Area change data from satellite remote sensing), 'EMISSION FACTOR' (Forest carbon stock change data from a national forest inventory), and 'EMISSIONS ESTIMATE' (Inventory of greenhouse gas emissions from the forest sector). A large 'X' symbol is placed between the first two components, and an '=' symbol is placed between the second and third components. A 'CO₂' icon is shown above the emissions estimate box.

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National Forest Monitoring Systems for REDD+
MRV FUNCTION: MEASUREMENT

IPCC Guidance and Guidelines

The image shows two book covers from the IPCC National Greenhouse Gas Inventories Programme. The left cover is 'Good Practice Guidance for Land Use, Land-Use Change and Forestry' and the right cover is '2006 IPCC Guidelines for National Greenhouse Gas Inventories'. Both covers feature the IPCC logo and the IGES logo.

IPCC Guidance and Guidelines for GHG Inventories Key Concepts

IPCC "Good Practice":

- Assists countries in **producing GHG inventories** that are accurate in the sense of being **neither over nor underestimates** so far as can be judged, and in which uncertainties are reduced as far as possible
- Provides methods to **manage uncertainties**
- Supports the development of GHG inventories that are:
 - Transparent
 - Documented
 - Consistent over time
 - Complete
 - Comparable
 - Assessed for uncertainties
 - Subject to quality control and assurance
 - Efficient in the use of resources available to inventory agencies
 - In which uncertainties are gradually reduced as better information becomes available

MRV for REDD+ IPCC Equation for Emission Estimates

The diagram is identical to the one in the top right, but with a red dashed circle around the 'ACTIVITY DATA' and 'EMISSION FACTOR' components, and the word 'MEASUREMENT' written across the circle.



IPCC Guidance and Guidelines for GHG Inventories

Key Concepts

- Activity Data**
 - Data on the **magnitude** of human activity, resulting in emissions/removals taking place during a given period of time (e.g. data on land area or management systems)
- Emission Factor**
 - A **coefficient** that relates the activity data to the amount of chemical compound (e.g. CO₂), which is the source of later emissions
- Removal Factor**
 - Rate** at which carbon is taken up from the atmosphere by a terrestrial system and sequestered in biomass and soil

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National Forest Monitoring Systems for REDD+

MRV FUNCTION: MEASUREMENT: ACTIVITY DATA

IPCC Guidance and Guidelines for GHG Inventories

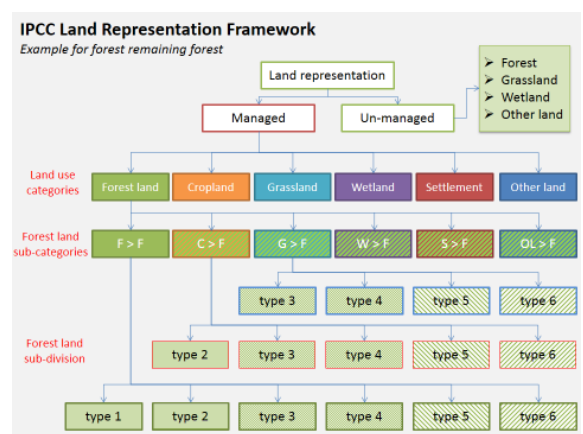
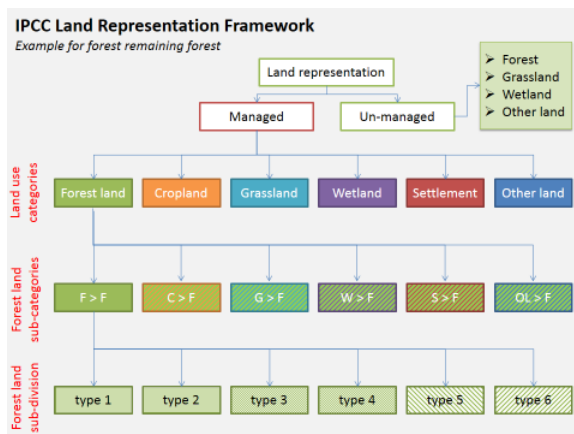
Key Concepts: Land Representation

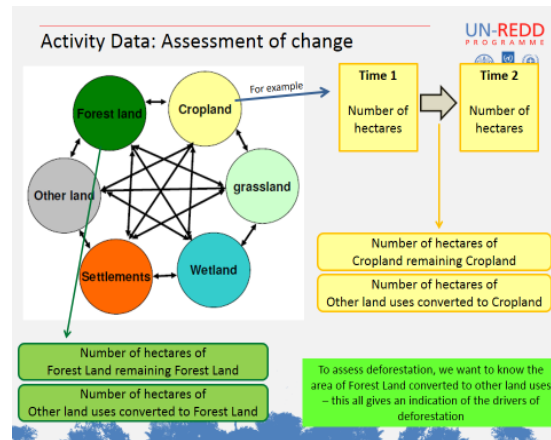
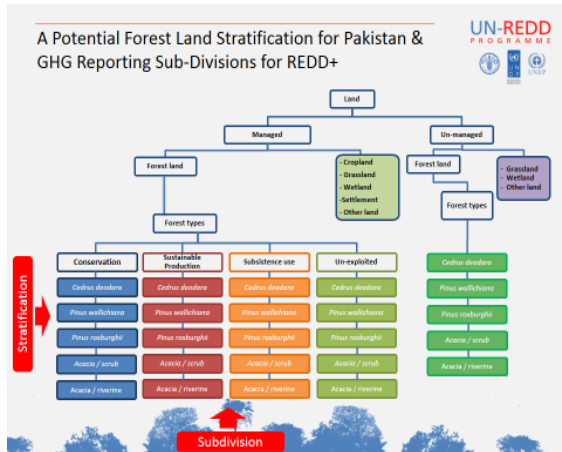
- Five principles described by IPCC. Systems for land representation should be:
 - Adequate:** capable of representing land-use categories, and conversions between land-use categories, as needed to estimate carbon stock changes and greenhouse gas emissions and removals
 - Consistent:** capable of representing land-use categories consistently over time; different approaches can be used in different locations or categories, as long as the overall results are not unduly affected
 - Complete:** that all land within a country should be included, recognizing the biophysical stratification of land if needed
 - Transparent:** data sources, definitions, methodologies and assumptions should be clearly described
 - Comparable:** Following IPCC guidance ensures that a country's land classifications are comparable with others

IPCC Guidance and Guidelines for GHG Inventories

Key Concepts: Land Representation

- Six land use categories
 - Forest land, Grassland, Cropland, Wetland, Settlement, Other land
- Each land-use category is further disaggregated to reflect the past and the current land use, for example under forest land you report the sub-categories:
 - Forest land remaining forest land
 - Lands converted to forest land
- Land-use categories and sub-categories may be further sub-divided according to land use practices or biophysical characteristics of the land
 - For example: forest land sub-divided by forest type:
 - Pine-dominated forest
 - Mangrove forest
 - Etc.





Activity Data: Assessment of Change

- IPCC guidance: Countries should **characterize and account for all relevant land areas** in a country consistently and as transparently as possible.
- Data should reflect the **historical trends in land-use area**
- IPCC 2003 LULUCF Guidance suggests three Approaches:
 - Approach 1: Basic land-use data (land use types in time 1 & land use types in time 2)
 - Approach 2: Survey of land use and land-use change (changes from & to a category)
 - Approach 3: Geographically explicit land use data (known locations of changes between categories)
- In most developing countries the only way to represent land in a consistent and transparent way with a historical time frame of 20 years is the use of **satellite remote sensing data**, which allows the adoption of Approach 3

Activity Data: Assessment of Change

Approach 3: Geographically Explicit Land Use Data

- Requires **spatially explicit observations of land use and land-use change**.
- The data may be obtained either by 1) **sampling** of geographically located points, 2) a complete tally (**wall-to-wall mapping**), or 3) a **combination** of the two
- Is comprehensive and relatively simple conceptually but **data intensive** to implement

Activity Data: Assessment of Change

Approach 3: Geographically Explicit Land Use Data

- By sampling of geographically located **points** or area subsets
- Information about those points can then be used to say something about a phenomena **over a broader area**

Sample frame: geographical grid (a sample at each 1° x 1°)
Sample size: 20 x 20 km (with context of 1:landed imagery for year 2000)

Activity Data: Assessment of Change

Approach 3: Geographically Explicit Land Use Data

- By **wall-to-wall mapping**
- Representation of **all** land area
- Generally more **resource-intensive** than sampling
- Sampling approaches in one reporting period can be extended to wall-to-wall coverage in a subsequent period



Activity Data: Assessment of Change Approach 3: Geographically Explicit Land Use Data

- All Annex 1 countries use IPCC Approach 3 to assess activity data

Most countries use sampling approaches A few countries use wall to wall approaches

Sweden

Australia

Activity Data in the GHG Inventory

Land Use Category	Sub-division	Area (ha)	Change in Carbon Stock (tC)	GHG Emissions (tCO ₂ e)
A. Total Forest Land				
1. Forest Land remaining Forest Land				
A1.1	Boreal Forest	1,234,567	12,345	123,456
A1.2	Tropical Forest	2,345,678	23,456	234,567
A1.3	Temperate Forest	3,456,789	34,567	345,678
A1.4	Other Forest	4,567,890	45,678	456,789
2. Land converted to Forest Land				
2.1 Cleared land converted to Forest Land				
A2.1	Boreal Forest	567,890	5,678	56,789
A2.2	Tropical Forest	678,901	6,789	67,890
A2.3	Temperate Forest	789,012	7,890	78,901
A2.4	Other Forest	890,123	8,901	89,012

Activity Data in the GHG Inventory

Geographical Location	Activity Data	Area subject to the activity (ha)	Change in Carbon Stock (tC)	GHG Emissions (tCO ₂ e)
Sweden	Forest Land remaining Forest Land	1,234,567	12,345	123,456
Australia	Forest Land remaining Forest Land	2,345,678	23,456	234,567
Australia	Land converted to Forest Land	3,456,789	34,567	345,678
Australia	Land converted to Forest Land	4,567,890	45,678	456,789

Sampling approach: Open Foris Collect Earth – Bhutan

National Forest Monitoring Systems for REDD+ MRV FUNCTION: MEASUREMENT: EMISSION FACTORS

Assessing Emission Factors National Forest Inventories

- Emission Factor: A coefficient that quantifies the **emissions or removals** in areas undergoing human-induced changes (e.g. tCO₂e/ha of forest cleared)
- Emission factors are quantified through **changes in carbon stocks** in the pools considered by the IPCC
- 41 out of 42 Annex 1 countries use NFIs as a data source to compile their national GHG inventory
 - Fulfills IPCC requirement of 'completeness'
- Diverse approaches to NFIs around the world



Assessing Emission Factors IPCC Tiers



- An average value, a proxy for direct measurement, giving an **estimate**
- IPCC identifies 3 'tiers' of methods to obtain estimates, with increasing accuracy
 1. Use IPCC default EF data (EF database)
 2. Apply country- or region-specific EFs which allow more disaggregated Activity Data. This requires prior calculation of the EFs (allometric equations)
 3. Regular, detailed inventories used to create very specific EFs and models



Assessing Emission Factors Carbon Inventories for the Land Use Sector



- Estimation must be made:
 - For carbon stock **CHANGES!** (= EFs)
 - For diverse **ecological conditions**
 - Under diverse **management regimes**
 - Emissions and removals due to **human activity**
 - For changes in all carbon pools
- IPCC requirements for NFIs
 - Estimations of Emission Factors made to Tier 2 or Tier 3 level – this requires:
 - **Country-specific** estimates of emission factors
 - **Multi-temporal** inventory data
 - **Uncertainty analysis** and Quality Assurance / Quality Control (QA/QC)



Main steps for Accurate Carbon Inventories in the Land Use Sector



1. Assess areas (Activity Data)
2. Consider all **five carbon pools**
3. Assess all **gains and losses**
4. Use best available data
5. Assess **uncertainty**
 - Depends on methodology used, assumptions, activity data, time series consistency of data
6. Try to verify



Need to Report on Changes in the Five Forest Carbon Pools



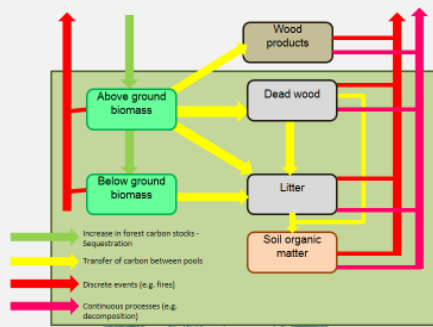
- Above-ground biomass
 - Below-ground biomass
- } biomass
- Deadwood
 - Litter
- } dead organic matter
- Soil
- { - mineral
- organic

$$\Delta C = \Delta C_{AB} + \Delta C_{BB} + \Delta C_{DW} + \Delta C_{LI} + \Delta C_{SO}$$





Changes in Forest Carbon Pools



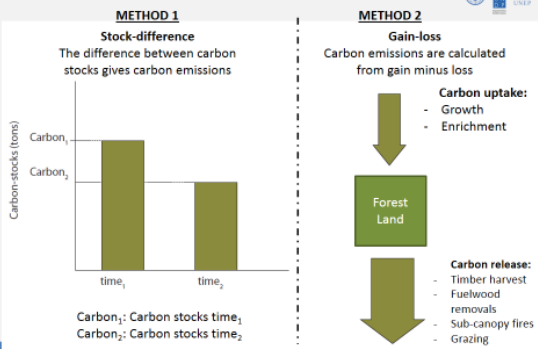
IPCC guidance on the carbon pools

- Apart from HWP, parties are **encouraged** to report on all other **significant** carbon pools
- Methods and pools must be **consistent**
- Distinguish between continuous processes and disturbance events
- Conversion factors can be used instead of direct measurement

The NFI as part of the MRV function for REDD+

- Fulfills many other functions, relating to REDD+ safeguards and non-REDD+ contexts
- Allows a country to **directly measure and estimate** forest carbon stocks and changes (Gain-Loss or Stock-Difference), including:
 - Standing volume
 - Biomass expansion factors
 - Allometric equations
- Allows a country to **generate specific EFs** for each identified category of forest and land use, creating empirical models for forest dynamics (forest age class distribution, emissions from a management strategy) thus enabling compliance with Tier 2 or Tier 3 reporting of GHG
- Tier 2 or Tier 3 (Tier 1: Default values: no NFI)
 - Tier 2:** IPCC default assumptions + default methodology + country specific data
 - Tier 3:** Country specific assumptions + methodology + data (to be internationally reviewed)

Direct Measurement of Changes Stock-Difference and Gain-Loss



Emission Factors in the GHG Inventory

TABLE 12.1 - IMPLIED CARBON STOCK CHANGE FACTORS FOR FOREST LAND

Land-use category/Chapter	Subcategory	Carbon stock change in above-ground biomass per		Carbon stock change in below-ground biomass per		Net carbon stock change in litter		Net carbon stock change in dead wood		Net carbon stock change in soils per		Implied emission / removal factor per area ¹⁰⁴
		Gains	Losses	Gains	Losses	Net change	Net change	Minerals	Organic	Minerals	Organic	
Forest Land (Chapter 4)	Forest Land Remaining Forest Land (FF)	Above-ground biomass	4.2.1	2.3.1.1	5A	⊕						
		Below-ground biomass	4.2.1	2.3.1.1	NE	⊕						
		Dead organic matter	4.2.2	2.3.2.1	NE	0						
		Soil carbon	4.2.3	2.3.3.1	5D	⊕ ¹						
		Non-CO ₂ from biomass burning	4.2.4	2.4.1	NE	⊕						
		Above-ground	4.2.1	2.3.1.1	5A	⊕						

Data Sources for Tier 1 default values

- Emission Factor Database: <http://www.ipcc-nggip.iges.or.jp/EFDB/main.php>
- Good Practice Guidance for Land Use, Land Use Change and Forestry (LULUCF) (2003)
- Guidelines for Agriculture, Forestry and Other Land Uses (AFOLU) (2006): many tables available

TABLE 12.2 - LAND-USE CATEGORIES, CARBON POOLS AND NON-CO₂ GASES TO BE ESTIMATED UNDER TIER 1, THEIR RELEVANCE TO AFOLU SECTIONS, AND THE REFERENCE TO 1996 IPCC GUIDELINES

Land-use category/Chapter	Subcategory	C pool & non-CO ₂ gases	Methods Section	Chapter 2 Method	Linkage to 1996 IPCC Guidelines	Tier 1 Method
Forest Land (Chapter 4)	Forest Land Remaining Forest Land (FF)	Above-ground biomass	4.2.1	2.3.1.1	5A	⊕
		Below-ground biomass	4.2.1	2.3.1.1	NE	⊕
		Dead organic matter	4.2.2	2.3.2.1	NE	0
		Soil carbon	4.2.3	2.3.3.1	5D	⊕ ¹
		Non-CO ₂ from biomass burning	4.2.4	2.4.1	NE	⊕
		Above-ground	4.2.1	2.3.1.1	5A	⊕



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Assessing Emission Factors through NFIs Key Messages



- NFIs are **national decision-making tools** so should be designed to meet a country's individual data / information needs, NOT just for REDD+
- NFIs are commonly used by countries (almost all Annex 1 countries) to assess Emission Factors for their national GHG inventory
- **Changes in all five forest carbon pools** should be reported on, but do not all require intensive measurement
- Two approaches set out by the IPCC for EF assessment are the **Gain-Loss** method (can be done using one NFI) and the **Stock-Difference** method (requires two NFIs)
- **Land use stratification** can be a useful first step to divide forest land into homogenous strata and ensure field sampling is statistically robust and cost-effective

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Thank you

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Annex III (e)

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National Forest Monitoring Systems for REDD+

Pakistan's National Forest Monitoring System Action Plan

Consultation Workshop


20th March 2014
Islamabad

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National Forest Monitoring Systems for REDD+

Pakistan's NFMS Action Plan
Consultation Workshop

Introduction to Pakistan's National Forest Monitoring System Action Plan




20th March 2014
Islamabad

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Presentation Outline

- Objectives of the National Forest Monitoring System Action Plan
- Examples from other countries
- National Forest Monitoring System Action Plan Template
- Tasks for Discussion Groups
- Next Steps



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National Forest Monitoring System Action Plans

OBJECTIVES

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Objectives

- To set out all the **details, tasks and responsibilities** required to develop Pakistan's National Forest Monitoring System to ensure:
 - Transparency
 - Accountability
 - Consistency with international guidance
- Clarify **institutional arrangements** for implementation of Pakistan's National Forest Monitoring System
- Follow **phased approach** to technical capacity building and implementation
- Collate **all sources of financial and technical support** into one document
 - Can see what is funded and what requires funding
 - Useful instrument for seeking international technical support
- Must be **country-driven!**

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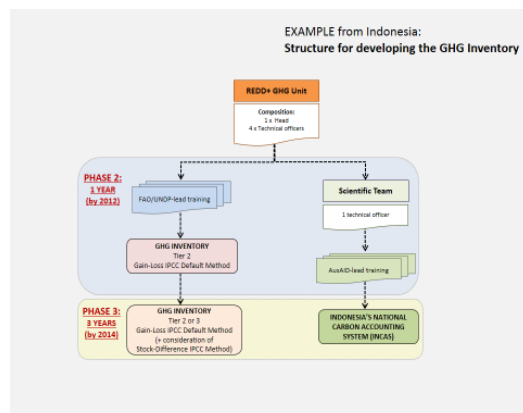
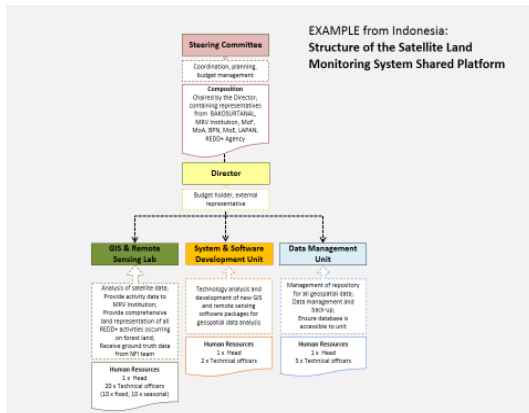
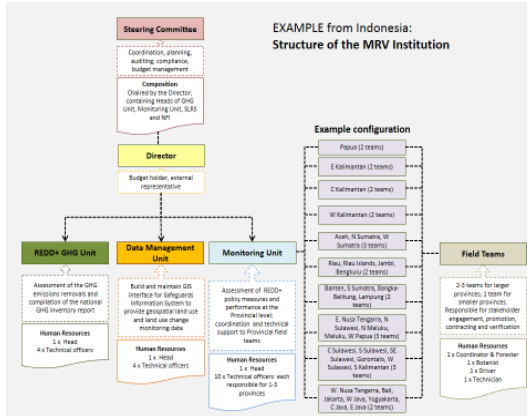
National Forest Monitoring System Action Plans

EXAMPLES FROM OTHER COUNTRIES



Different Countries, Different Approaches

- Five countries to date have developed (draft) National Forest Monitoring System Action Plans in the Asia Pacific region with the support of UN-REDD
- Each country has taken an individual approach, based on its national circumstances
- A key activity is to reach agreement on the roles that different ministries, institutions, agencies and/or organizations will play
 - Institutional arrangements for the National Inventory System



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National Forest Monitoring System Action Plan Template

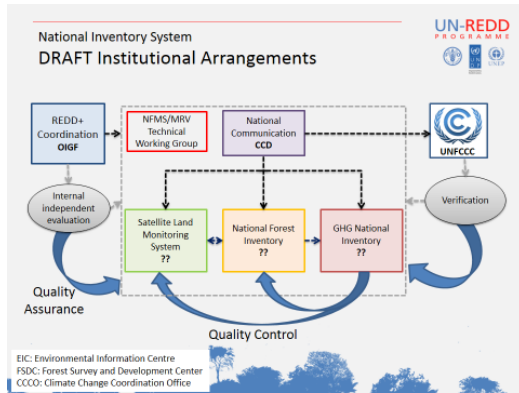
CONTENTS

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NFMS Action Plan Template

CONTENTS

- Introduction
- National Circumstances
- Capacity Assessment
 - Remote sensing and GIS, Forest Inventory, Greenhouse Gas Inventory
- National Forest Monitoring System Development through REDD+ Implementation
 - Institutional Arrangements and Capacity Building (Phase 1)
 - MRV Function (Piloting in Phase 2; Implementation in Phase 3)
 - Satellite Land Monitoring System
 - National Forest Inventory
 - Greenhouse Gas Inventory
 - Monitoring Function (Piloting in Phase 2; Implementation in Phase 3)
- Risk Assessment
- Budget and Work Plan



What is needed in the Action Plan

- Agreed **institutional arrangements and linkages** for the NIMS as a whole
- Institutional **arrangements of individual components**
 - For example how to implement and manage the national forest inventory?
- **Detailed and up-to-date information on capacity assessment** for each technical component
- Details of specific activities and processes – for example of quality assurance and quality control procedures
- You (Pakistan) need to **decide how much detail to go into**
 - **Keep it a light and accessible document or make it a more practical step-by-step guide?**

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Pakistan's National Forest Monitoring System Action Plan

GROUP DISCUSSIONS ON NEXT STEPS

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Group 1: Institutional arrangements for Pakistan's National Forest Monitoring System

Question-1: What are the institutions in Pakistan relevant to Forest Monitoring Systems at National and Provincial levels?

Question-2: How do these institutions currently monitor forestry activities in Pakistan?

Question-3: What are the capacities needed for a National Forest Monitoring System and what are the key capacity gaps in Pakistan (human, technical, financial)?

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Group 2: Remote sensing and GIS for forest monitoring – activities, gaps and needs

Question-1: What Satellite, GIS, Remote Sensing data does Pakistan currently have access to?

Question-2: What historical reference maps and data are available for land use classification and land use change monitoring?

Question-3: Which institutions have the capacity to analyze GIS/ Remote Sensing data, and what are the national gaps in capacity?

Question-4: What GIS/Remote Sensing tools could be used to improve data coverage and quality and what are the advantages and drawbacks of each of these tools?

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Group 3: National Forest Inventory in Pakistan

Question-1: How is "forest" defined in Pakistan; is there a single definition or does it vary between institutions and provinces?

Question-2: What is the history of Forest Inventory in Pakistan?

Question-3: Are there any growth models for tree species and forest types in Pakistan; how widely known and used are they?

Question-4: What are the various options for methodology for National Forest Inventory in Pakistan, and what are their comparative advantages and drawbacks?

Question-5: What are the capacity gaps for NFI implementation (human, technical, financial)?



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Group 4: Pakistan's national GHG inventory and UNFCCC reporting



Question-1: What is the current process for National Green House Gas Inventory in Pakistan?

Question-2: How is LULUCF incorporated in the National GHG inventory?

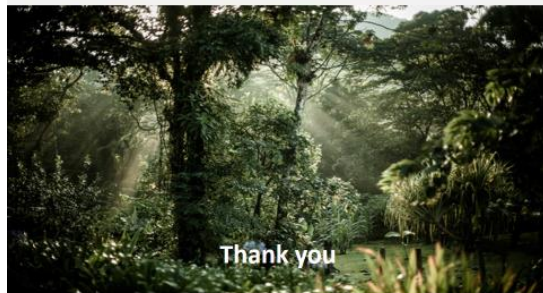
Question-3: What are the processes for data quality assurance and quality control?

Question-4: What are the national capacities and gaps for GHG inventory?

Next Steps for the Action Plan



- **NFMS/MRV Working Group** to build on the discussions today
 - Group formed and met in May last year, as part of R-PP development
 - Reconvene, include provincial focal points
 - Direct and monitor progress of NFMS Action Plan development
 - WWF-P to coordinate
- **UN-REDD/FAO support through LoA with WWF-P**
 - Capacity assessment
 - Methodology for spatial analysis developed and data availability for GHG inventory
 - Training events on GHG-I and SLMS
 - Provincial and national validation of NFMS Action Plan by end 2014
- Agree upon details of the **process to finalize and endorse** / approve the Action Plan



Thank you

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Annex IV Pictures of the event





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