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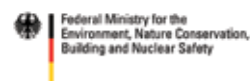
FOR MOUNTAINS AND PEOPLE

REDD+ in the Hindu Kush Himalayas

A stocktaking study from Bhutan, India, Myanmar, Nepal, and Pakistan

NORWEGIAN MINISTRY OF FOREIGN AFFAIRS

On behalf of:

Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety

of the Federal Republic of Germany

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

About ICIMOD

The International Centre for Integrated Mountain Development, ICIMOD, is a regional knowledge development and learning centre serving the eight regional member countries of the Hindu Kush Himalayas – Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan – and based in Kathmandu, Nepal. Globalization and climate change have an increasing influence on the stability of fragile mountain ecosystems and the livelihoods of mountain people. ICIMOD aims to assist mountain people to understand these changes, adapt to them, and make the most of new opportunities, while addressing upstream-downstream issues. We support regional transboundary programmes through partnerships with regional partner institutions, facilitate the exchange of experience, and serve as a regional knowledge hub. We strengthen networking among regional and global centres of excellence. Overall, we are working to develop an economically and environmentally sound mountain ecosystem to improve the living standards of mountain populations and to sustain vital ecosystem services for the billions of people living downstream – now, and for the future.

REDD+ in the Hindu Kush Himalayas

A stocktaking study from Bhutan, India, Myanmar, Nepal, and Pakistan

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Preface

Over the past decade, REDD (reducing emissions from deforestation and forest degradation) has emerged as an important policy instrument for the conservation and sustainable management of landscapes. International climate negotiations and strategies largely focus on emissions reductions in developing countries by providing incentives to reduce deforestation and forest degradation. ICIMOD has been involved in community forestry in Nepal since its beginning, and has successfully implemented a REDD+ pilot project in the community forests of three watersheds in Nepal. Today, ICIMOD is recognized as a global pioneer in developing models for REDD+ implementation at the community level and has rich experience in community-based approaches to REDD+. Based on the lessons that ICIMOD has learned, and considering the growing interest of its regional member countries in the Hindu Kush Himalayas (HKH) to prepare for and participate in REDD+, ICIMOD established the Regional REDD+ Initiative in 2014.

REDD+, under the United Nations Framework Convention on Climate Change (UNFCCC), has been endorsed by all of ICIMOD's regional member countries (Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan). Bangladesh is a member of the United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD), while Bhutan, Nepal, and Pakistan receive targeted support from UN-REDD. In addition, Bhutan, Nepal, and Pakistan are REDD+ participants in the Forest Carbon Partnership Facility (FCPF) of the World Bank.

It is anticipated that implementation of REDD+ on the ground will require a substantial amount of data, information, and preparation by participating countries. However, as REDD+ is still in its emerging stages, only limited data and information are available on the HKH region and, overall, there is a dearth of trained human resources for REDD+ implementation at all levels. The HKH region has not received due attention in relation to forest ecosystems and there is a need to demonstrate that REDD+ principles are also valid in non-tropical countries.

Therefore, this stocktaking study was suggested at a joint donor meeting held at ICIMOD in 2014. The study was conducted by ForestAction Nepal and ICIMOD under ICIMOD's Regional REDD+ Initiative in five selected countries of the HKH – Bhutan, India, Myanmar, Nepal, and Pakistan. It collates and reviews available information to analyse the gaps and strengths of the measures adopted for REDD+ readiness by these countries. The study is expected to provide a basis for conceptualizing, implementing, and monitoring the impacts of REDD+ readiness in these countries.

The study recognizes the need to ensure the continuation of the multiple benefits of forests while implementing REDD+, while simultaneously stressing the importance of a new model of community-private forest partnership for REDD+ as an emerging forest management regime, based on the existing forest management practices in the five countries studied. The study emphasizes that it is equally important to develop an effective and efficient cost-benefit sharing mechanism for forest carbon and non-carbon categories, taking into account social safeguards – a point that has also been emphasized by the UNFCCC. On behalf of ForestAction Nepal and ICIMOD, we would like to thank all the professionals and individuals who contributed to this study.

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Acknowledgements

Acronyms

ANSAB	Asia Network for Sustainable Agriculture and Bioresources
CFUG	community forest user group
COP	Conference of the Parties
DFID	Department for International Development
ESMF	Environment and Social Management Framework
FAO	Food and Agriculture Organization
FCPF	Forest Carbon Partnership Facility
FECOFUN	Federation of Community Forestry Users, Nepal
GDP	gross domestic product
GIS	geographic information system
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
HKH	Hindu Kush Himalayas/Himalayan
ICIMOD	International Centre for Integrated Mountain Development
IPCC	Inter-governmental Panel on Climate Change
IUCN	International Union for Conservation of Nature
MBIGS	Multiple Benefits, Impacts, Governance and Safeguards
MRV	monitoring, reporting and verification
NFMS	national forest monitoring system
NGO	non-governmental organization
NTFP	non-timber forest product
PES	payment for ecosystem services
PFE	Permanent Forest Estate
REDD	Reducing Emissions from Deforestation and Forest Degradation
REDD+	Reducing emissions from deforestation and forest degradation, and the role of conservation, sustainable management of forests and enhancement of forest carbon stock in developing countries
REL	reference emission level
RL	reference level
R-PP	Readiness Preparation Proposal
RS	remote sensing
SES	Social and Environmental Standard
SESA	Strategic Environmental and Social Assessment
SIS	safeguard information system
TWG	technical working group
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UN-REDD	United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries
USAID	United States Agency for International Development
USD	United States Dollar
WMD	Watershed Management Division
WWF	World Wide Fund for Nature

Executive Summary

REDD+ (reducing emissions from deforestation and forest degradation, and the role of conservation, sustainable management of forests and enhancement of forest carbon stock in developing countries) is an emerging international climate policy instrument under the aegis of the United Nations Framework Convention on Climate Change (UNFCCC). This performance-based tool aims to reduce anthropogenic greenhouse gas emissions by incentivizing developing countries to reduce rates of deforestation and forest degradation and enhance carbon sinks by enriching forest resources. In this context, five countries of Hindu Kush Himalayan (HKH) region – Bhutan, India, Myanmar, Nepal, and Pakistan – have been engaged in REDD+ processes since the instrument's inception.

An assessment of these five countries in terms of the REDD+ readiness process was carried out to review the relevant knowledge gaps and generate momentum for REDD+ readiness in the HKH region. This study is primarily a desk review of the relevant literature, including REDD+ Readiness Preparation Proposals (R-PPs), research papers, and other documents retrieved from the archives of the UNFCCC web portal. The R-PP documents of the respective countries (except India) are the major sources of information for the study.

The study found that the REDD+ readiness process is at different stages in the five countries studied. Nepal is ahead in the process and Bhutan, India, Myanmar, and Pakistan are gaining momentum. Bhutan, Myanmar, Nepal, and Pakistan have all submitted R-PPs. In addition, Bhutan, Nepal, and Pakistan are partner countries of the United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD) and Forest Carbon Partnership Facility (FCPF), whereas Myanmar is a new UN-REDD partner country. Although India has not yet submitted its R-PP, it is at an advanced stage of database management of its forest resources, which is essential for receiving financial incentives from the REDD+ mechanism in the future. Collaboration and coordination are needed among the counties in the HKH region to develop forest resource databases for REDD+, as well as to raise their collective voice for the benefit of the people of the region, particularly those living in mountain communities. For this, a regional consortium of HKH countries needs to be established to lobby at international forums such as the UNFCCC and to benefit from the Green Climate Fund.

The study identified three broad forest management regimes in the five countries studied: government, government-community partnership, and private. However, fair and transparent cost-benefit sharing and social safeguard mechanisms are yet to be developed for each management regime covering both carbon and non-carbon categories of REDD+. The engagement of a new community-private model needs to be considered for the sustainable management of forests. This new community-private forest partnership should be encouraged in the REDD+ development process and recognized as an emerging forest management regime.

The study also found that, although the rates of deforestation and forest degradation are not the same across the HKH region, their major causes are similar and include the demand and supply gap for forest products, conversion of forest areas for development activities, illegal logging, and encroachment on forest lands. These challenges need to be addressed by raising public awareness and by crafting pro-people and socially inclusive policies, strategies, and legal instruments for REDD+ mechanisms.

The success of any REDD+ mechanism also depends on the co-benefits it generates at the grassroots levels during implementation. Only focusing on the trading of forest carbon may not be adequate for grassroots actors in the HKH region to participate in the REDD+ mechanism. Thus, co-benefits must be valued and given priority in the REDD+ process, as these are usually more significant than the financial incentives received from the trading of forest carbon.

Finally, the study recommended the adoption of a non-market based approach for REDD+ financing for the HKH region as it complements existing efforts by the countries in the region for biodiversity conservation, improved ecosystem services, and poverty reduction through devolved forestry sector governance. Although market-based approaches have distinct benefits, there are numerous risks and limitations in the HKH region due to the inadequate

capacity of human resources, lack of quality forest resources data, and high upfront and transaction costs. A non-market based approach provides better opportunities for the proportional allocation of resources among the five REDD+ activities than a carbon-centred approach based solely on the quantification of carbon emissions. Such an approach would also create synergies between mitigation and adaptation measures for climate change, deliver more equitable outcomes for REDD+ implementation, and has greater potential to achieve the Sustainable Development Goals in years to come than market-based approaches.

This study makes the following recommendations regarding the development of a REDD+ mechanism for the HKH region:

- **Recommendation 1**: Establish a regional consortium of HKH countries to share best practices for REDD+ readiness; encourage information sharing and collaboration for the development of databases of forest resources for REDD+ specific to HKH region; and jointly lobby at international forums such as the UNFCCC, as well as grasp opportunities such as those provided by the Green Climate Fund.

- **Recommendation 2**: Develop a suitable incentive-based mechanism that will draw private sector investment and engagement in REDD+. So far the private sector has not been an active stakeholder in the REDD+ discourse in the HKH region, but it is key to the successful implementation and sustainability of REDD+.

- **Recommendation 3**: Develop and pilot (in select countries of the HKH) a new model of community-private forest partnership as part of the REDD+ implementation process for the HKH region.

- **Recommendation 4**: To overcome the challenges facing REDD+ implementation in the HKH region, it is necessary to raise public awareness of REDD+; formulate pro-people and socially inclusive policies, strategies, and legal instruments for REDD+; and enhance the capacity of stakeholders (government, non-government, civil society, women, indigenous peoples, and tribes, etc.), particularly those at the grassroots, to participate in REDD+ and to maximize the benefits accruing to communities from forest carbon and non-forest carbon trading under the REDD+ mechanism.

- **Recommendation 5**: Value and prioritize the co-benefits generated by the REDD+ mechanism at the grassroots level to ensure that local communities receive incentives from carbon and non-carbon benefits.

- **Recommendation 6**: Adopt a non-market based approach for REDD+ financing in the HKH region, as it complements existing efforts by the countries of the region for biodiversity conservation, improved ecosystem services, and poverty reduction through devolved forestry sector governance and has greater potential to achieve the Sustainable Development Goals in the years to come than market-based approaches.

Chapter 1: Introduction

Context

REDD+ (reducing emissions from deforestation and forest degradation, and the role of conservation, sustainable management of forests and enhancement of forest carbon stock in developing countries) is an emerging international climate policy instrument under the aegis of the United Nations Framework Convention on Climate Change (UNFCCC). REDD+ is expected to tap the large mitigation potential for conserving and better managing the world's forests through financial flows from developed to developing countries. The REDD+ instrument links economic incentives to the conservation and management of forest resources (Shrestha et al. 2014). This performance-based tool aims to reduce anthropogenic greenhouse gas emissions by incentivizing developing countries to reduce rates of deforestation and forest degradation and enhance carbon sinks by enriching forest resources.

Five core elements of REDD+
• Reducing emissions from deforestation
• Reducing emissions from forest degradation
• Role of conservation
• Sustainable management of forests
• Enhancement of forest carbon stocks

Global discourse on climate change and REDD+ has progressed rapidly over the years, but has largely remained confined to international and national institutions (especially academia, policy makers, and forestry technicians). There is general acknowledgement that the REDD+ debate has not reached the grassroots level, despite the fact that climate change and REDD+ are issues that directly affect grassroots actors in more way than one (Roy et al. 2014). In this document, grassroots actors are the people engaged in grassroots forest management and development activities including government and non-governmental actors, civil society, user groups, local media persons, and social activists, particularly forest dependent people such as women, indigenous peoples, tribes, and Dalits who are socially and economically marginalized. Limited access to updated information on the global climate change discourse, language difficulties, the complexity of the subject, and the poor capacity of grassroots stakeholders to articulate their concerns has created a disconnection between the global discourse on REDD+ and local and national contexts.

In 2009, at the fifteenth UNFCCC Conference of the Parties (COP 15), Decision 4 defined the elements of REDD+ as: "Methodological guidance for activities relating to reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries". This definition provides more substantive information on the requirements for REDD+. Before this decision, only the aspects of reducing emissions from deforestation and forest degradation were considered. COP 15 recognized the role of conservation, the sustainable management of forests, and enhancement of forest carbon stock, making REDD+ more relevant to the Hindu Kush Himalayan (HKH) region and South Asian countries in general.

At COP 16 in Cancun in 2010, a positive decision on REDD+ defined the scope of REDD as "policy approaches and positive incentives on issues relating to reducing emissions from deforestation and forest degradation; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries". The Cancun Agreement also introduced 'safeguards' for REDD+ and reiterated the requirements for a national forest monitoring system (NFMS) to ensure that the implementation of REDD+ at the national level does not have detrimental effects on the environment or the local population.

At COP 20 in Warsaw in 2013, seven decisions on REDD+ were made and are jointly known as the 'Warsaw Framework on REDD+'. These decisions pertain to results-based finance; the coordination of support for

Forest degradation is difficult to trace and occurs over many years

implementation; modalities for national forest monitoring systems; presenting information on safeguards; the technical assessment of reference emission levels or reference levels (REL/RLs); modalities for monitoring, reporting, and verification (MRV); and information on addressing the drivers of deforestation and forest degradation.

The two main multilateral readiness platforms for REDD+ – the United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD) and the Forest Carbon Partnership Facility (FCPF), which is housed at the World Bank – are well aware of the challenges faced by countries in preparing for, and successfully implementing, REDD+. As a result, these two initiatives are actively coordinating their efforts. The FCPF and UN-REDD work together at the international level, harmonizing normative frameworks and organizing joint events, as well as at the national level, where joint missions and the sharing of information are producing coordinated support interventions. UN-REDD works in close partnership with other REDD+ initiatives, especially those operated by the World Bank, and supports the implementation of UNFCCC decisions.

Rationale and objectives

Bhutan, India, Myanmar, Nepal and Pakistan have been engaged in REDD+ readiness in one way or another since the concept's inception and have endorsed the UNFCCC's decisions on REDD+. Bhutan, Nepal, and Pakistan are UN-REDD and FCPF partner countries, while Myanmar is a new UN-REDD partner country. Nepal has taken a lead role in getting ready for REDD+ and submitted its REDD+ Readiness Preparation Proposal (R-PP) to the World Bank in 2010 (Government of Nepal 2010). Bhutan, Myanmar, and Pakistan submitted their R-PPs in 2013 and India is yet to submit its R-PP. Hence, it can be seen that all five countries are at different stages of the REDD+ process. Accordingly, this study reviews the status of these countries in terms of REDD+ readiness and highlights the relevant knowledge gaps. It is expected that the study will generate momentum for REDD+ readiness in the HKH region.

The objectives of this study are to:

- Review and document the present status of REDD+ readiness in five selected countries of the HKH region, namely, Bhutan, India, Myanmar, Nepal and Pakistan
- Assess the gaps in the REDD+ readiness process in these five countries

Methodology

The study was conducted primarily as a desk review of relevant literature, including a review and analysis of the REDD+ R-PP documents of each country, as well as research papers and other documents retrieved from the archives of the UNFCCC web portal. The R-PPs of the study countries (except India) were the main sources of information for the study. In addition, several journal articles, policy briefs, discussion papers, and book chapters were also reviewed to supplement and verify the information contained in the R-PPs.

REDD+ at the UN Climate Conference COP 20 in Lima 2014

Reinhard Wolf, GIZ

The twentieth UN Climate Conference (COP 20) took place from 1–12 December 2014 in Lima, Peru. Three REDD+ related items were on the agenda: REDD+ safeguards, the Bolivian proposal for non-market based approaches with a focus on the joint mitigation and adaptation approach, and the 'Meeting of National REDD+ Focal Points'. In addition, there were numerous side events on REDD+, including at the Landscape Forum. Before COP 20, the REDD+ Partnership conducted a two-day meeting in Lima. Here is a brief summary of the three main agenda items.

REDD+ safeguards

In advance of COP 20, developing countries were invited to submit their views on the experiences and lessons learned from developing systems for providing information on how REDD+ safeguards are addressed and respect the safeguard information system (SIS) as described and decided in Cancun in 2010, as well as the challenges they faced in developing such systems. All countries and observer organizations were invited to submit comments on the type of information that should be contained in the SIS. The submissions were published on the UNFCCC website. However, at COP 20, countries could not reach a consensus as to whether or not further guidance on SIS is needed and, therefore, the negotiations on this topic will continue at the next session in Bonn in June 2015.

Non-market based approaches – Bolivia's joint mitigation and adaptation approach

Bolivia presented a draft decision text on non-market based approaches, which, however, was not accepted as the basis for discussion by a number of countries. As with the discussion on safeguards, countries could not reach a consensus on this topic and, therefore, negotiations on this issue will continue in the next session in Bonn in June 2015.

The meeting of national REDD+ focal points

The need for a national meeting of REDD+ focal points was decided at COP 19 in Warsaw. At the first meeting of REDD+ focal points in Lima, it was decided that future meetings should be held annually during the Bonn sessions. At the meeting in Lima, which was facilitated by the Polish and Peruvian COP presidents, mainly procedural questions were discussed. There was wide support for the proposal that meetings be open to all stakeholders, including indigenous people and local communities, and that they should have an informal character. The co-facilitators announced that they would provide an agenda in advance of the next meeting and prepare a summary of this meeting. The International Institute for Sustainable Development (IISD) also published a briefing note on the first meeting.

Side events

REDD+ was the focus during the Global Landscape Forum, which was held on the weekend between the first and the second weeks of the Lima Climate Conference. The Peruvian COP Presidency declared 8 December as 'Lima REDD+ Day'. As one of the highlights of this day, the Government of Peru organized an event 'Showcasing REDD+ Implementation in Developing Countries'. Five countries announced their submission of REDD+ Forest Reference Levels to the UNFCCC secretariat.

Meeting of the REDD+ Partnership

At the forefront of the Climate Conference was the last meeting of the REDD+ Partnership, which was held in Lima 27–28 November 2014. At the meeting it was decided to close the REDD+ Partnership. This was no surprise because the Partnership had always been an interim measure to bridge the gap until a 'REDD mechanism' was established under the UNFCCC. With the 'Warsaw Framework for REDD+' in place, the members of the Partnership agreed that this condition had been fulfilled. It was also decided that the secretariat of the Partnership (the World Bank) will administer the remaining activities, which will go beyond 2014, including the continuation of the Voluntary REDD Database by the Food and Agriculture Organization (FAO) for two more years.

To conclude, while negotiations on REDD+ did not progress much in Lima, there was an impressive demonstration of progress on the side of REDD+ implementation.

Chapter 2: REDD+ in Bhutan

Bhutan is a small mountainous country located in the eastern Himalayas. It has a geographical area of 38,394 km² with a population of 733,643 (United States Central Intelligence Agency 2014) and population growth rate of 1.13%. The country is characterized by fragile mountainous ecosystems with elevations ranging from 130 masl to over 7,500 masl in the north where it borders the Tibet Autonomous Region of China.

Forest resources

Current forest cover

Although a developing country, Bhutan possesses a very high level of forest cover with a very low rate of deforestation and forest degradation. The most dominant land cover is forest, making up 70.45% of the land area (Department of Forests and Park Services 2011; Ministry of Agriculture and Forests 2011). Bhutan also ranks as one of the top countries on Earth in terms of species diversity and has the highest proportion of land in protected areas, as well as the highest proportion of forest cover of any Asian nation (National Biodiversity Centre 2009).

Bhutan believes in Buddhist principles, and its development vision of Gross National Happiness seeks to maximize human wellbeing instead of economic growth. It has demonstrated consistent social and government commitment to

Paro Valley, Bhutan

conserve forests and other natural resources, and there is provision in the Constitution of Bhutan to conserve at least 60% of its land as forest (Noord 2010). Protected areas make up 26.23% of the total land area, spread over five national parks and four wildlife sanctuaries (Department of Forests and Park Services 2011; Ministry of Agriculture and Forests 2011). Forest ecosystems deliver various services beyond timber extraction, fuelwood, and other non-timber forest products (NTFPs) (FAO 1999). Forests play a key role in watershed management, carbon sequestration, flood regulation, air filtering, and micro-climatic condition regulation. Water quality is higher with less sediment and fewer pollutants in forested catchments than in non-forested ones. A decrease in forest cover and the degradation of forest ecosystems can endanger the benefits that communities derive from these ecosystems.

The vegetation types of Bhutan fall into three zones: alpine (above 4,000 masl), temperate (between 1,000 and 4,000 masl, and subtropical (from 150 to 1,000 masl) (Royal Government of Bhutan 2013). Forest types have been classified into eight groups, namely, fir (*Abies densa*) forest (3,200 to 3,800 masl), mixed conifer forest (2,600 to 3,200 masl), blue pine (*Pinus wallichiana*) forest (2,100 to 3,000 masl), chir pine (*Pinus roxburghii*) forest (900 to 1,800 masl), broadleaf mixed with conifer forest, upland hardwood forests (2,000 to 2,900 masl), lowland broadleaf forest (130 to 2,000 masl), and forest scrub (Grierson and Long 1983; Ohsawa 1987). More than 300 species of medicinal plants, 400 species of orchids, and 5,500 vascular plants are found in Bhutan.

Since 1995, Bhutan's total forest area has slowly expanded (Land Use Planning Project 1995; Ministry of Agriculture and Forests 2011). Bhutan currently has 24,400 hectares under forest plantation (Department of Forests and Park Services 2011). Grassland cover has remained constant, while agricultural land has decreased substantially (Table 1).

Significance of forests to local livelihoods

The overall contribution of the forest sector to gross domestic product (GDP) stood at 3.18% in 2011. Despite a continuous increase in the overall output of the forestry sector, its contribution to GDP is steadily declining, due to the faster growth of other sectors like hydropower and tourism. Between July 2008 and June 2011, 16.5 million cubic feet of timber and 5.7 million cubic feet of fuelwood were supplied at subsidized rates to rural communities. During the same period, the entire commercial timber and fuelwood production of the country stood at 8.2 million and 3.6 million cubic feet, respectively, highlighting the strong dependence of rural communities on forest products. Rural communities also receive permits to collect NTFPs upon payment of minimal royalty fees (National Statistics Bureau 2012). Apart from these direct benefits, indirect benefits, such as ecosystem services, are also derived from forests. The country's economy is based on hydropower, and about 80% of the water comes from watersheds. With the country's goal to harness 10,000 MW of hydropower by 2020, the dependence on forests for a continuous supply of clean water will increase further.

Recognizing the multiple benefits of forests and their potential to enhance livelihoods and socioeconomic development, the Royal Government of Bhutan has always emphasized the importance of conservation and the sustainable management of forest resources for the long-term benefit of the people. With close to 69% of the

Table 1: **Trends in forest and other land cover types, 1990–2010 (in km²)**

Broad national land cover classes	1995	2011
Forest	2,579	2,705
Scrub/shrub	325	401
Grassland/pasture	156	158
Agriculture	315	113
Other	632	463
Total	4,007	3,8391

[1]After boundary revision

Source: Land Use Planning Project 1995; Ministry of Agriculture and Forests 2011

Note: Different aerial photographs and various satellite images were used during the Land Use Planning Project in 1995 and ALOS (10 M) satellite images were used exclusively during the Land Classification Mapping Project conducted in 2011.

population dependent on subsistence agriculture (National Statistics Bureau 2012), forests play a key role in the overall productivity of farming systems (Roder et al. 2003) and their contribution in enhancing the economic development of the rural population. Considering that local people's participation is key to the sustainable management of natural resources, the Royal Government of Bhutan has framed various enabling policies and acts to ensure public participation, from initial decision making through to implementation (Royal Government of Bhutan 2013).

Drivers of deforestation and forest degradation

A comprehensive assessment of the drivers of deforestation and forest degradation has not been carried out in Bhutan (Noord 2010), however, deforestation is generally not considered to be a major problem. Forest cover assessments showed a slight increase from 1995 to 2011, which might be due to the use of different datasets during the Land Use Planning Project and the Land Classification Mapping Project mapping processes (Land Use Planning Project 1995; Ministry of Agriculture and Forests 2011).

Nonetheless, the construction of major hydropower plants along with associated high-tension power lines started mostly after satellite data for the last forest cover assessment was acquired and, accordingly, deforestation is presumed to have increased considerably. Other than high-tension power lines and hydropower, activities such as housing and road construction, mining and quarrying, livestock grazing, slash-and-burn agriculture, forest fires, fuelwood collection, timber felling, poaching and illegal logging, the harvesting of NTFPs, and leaf litter collection, as well as invasive species, pests, and diseases, are contributing to deforestation and forest degradation. The most relevant drivers of forest degradation are activities linked to the unsustainable use of forest and other land resources (Royal Government of Bhutan 2013).

The 218-acre Tsentog Shari Community Forest is managed by 36 households in Tsentog Geog, Bhutan

Status of REDD+

REDD+ R-PP

In 2012, Bhutan initiated a REDD+ readiness planning process, which, in 2013, led to the development of Bhutan's REDD+ R-PP. The goal of Bhutan's R-PP is to prepare the country to be engaged in, and derive benefits from, the emerging performance-based REDD+ payment system in the context of the international climate negotiations of the UNFCCC. Bhutan's REDD+ R-PP contains the activities being undertaken by Bhutan under a special grant received from the World Bank. During the R-PP formulation phase, awareness raising and consultation programmes were carried out with different stakeholders at the district level in consultation with local government authorities. The operations manual prepared by Bhutan provides the intended arrangements agreed with the World Bank for the implementation of the REDD+ Readiness Programme in Bhutan (Royal Government of Bhutan 2013).

Institutional setup

High-level strategic planning bodies at the national level, such as the National Committee on Climate Change, Multi Sectoral Technical Committee on Climate Change, Technical Working Group (TWG), REDD+ Secretariat, and REDD+ Taskforce, are some of the institutions established by Bhutan during the readiness phase. The Watershed Management Division (WMD) of the Department of Forests and Park Services, under the Ministry of Agriculture and Forests has been designated as the REDD+ Secretariat and coordinated the preparation of the present R-PP document. The WMD will be responsible for screening all REDD+ related activities, for which it will function as the 'competent authority', and for coordinating periodic environmental monitoring for compliance (Royal Government of Bhutan 2013).

Figure 1: **Institutional arrangements for REDD+ in Bhutan**
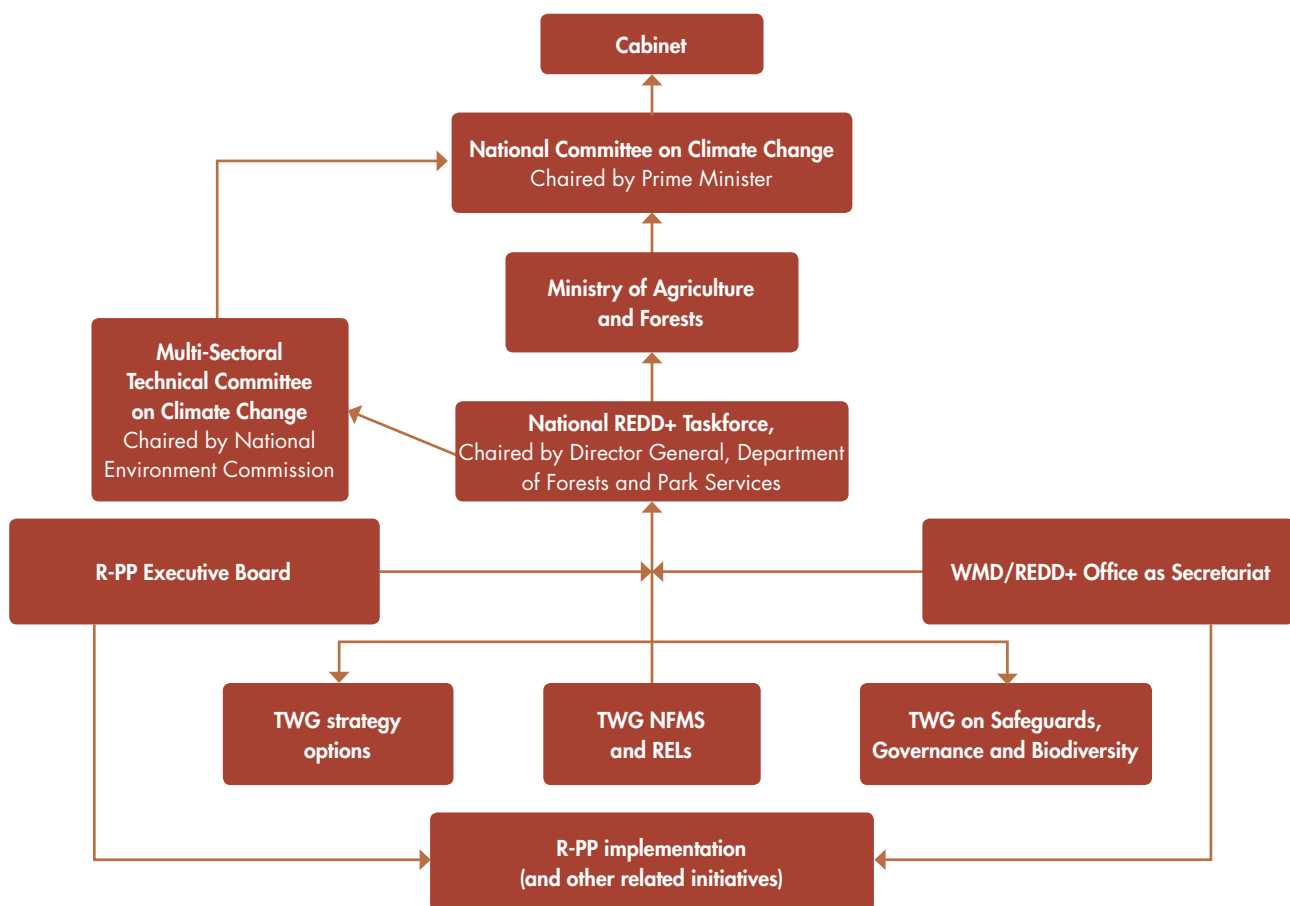
Source: Royal Government of Bhutan 2013

Information sharing activities

A series of awareness programmes on REDD+ at the national and sub-national levels were conducted to help disseminate knowledge and information on REDD+ to stakeholders, including those at the grassroots level. The formulation of the R-PP started with a consultation of REDD+ TWG members, comprising representatives from the Department of Agriculture, Department of Livestock, Department of Forests and Park Services, College of Natural Resources (Royal University of Bhutan), Ministry of Finance, Department of Public Accounts (Ministry of Finance), Gross National Happiness Commission, Natural Resource Development Corporation Limited, Royal Society for Protection of Nature, Bhutan Trust Fund for Environmental Conservation, and National Environment Commission. The members of the TWG are also responsible for informing their parent organizations about REDD+ and the R-PP. The WMD has prepared and circulated reports on all the national REDD+ workshops held so far (Royal Government of Bhutan 2013).

Country commitment to REDD+ implementation

Bhutan's commitment to the implementation of REDD+ can be measured by its commitment to improving governance for REDD+, new policy interventions for REDD+, measures for local and community level participation, and provision for REDD+ funding.

- Improvement of governance: The R-PP states that forest dependent communities must receive the benefits of REDD+ to make the mechanism sustainable (Royal Government of Bhutan 2013). For this, effective, efficient, and equitable governance systems must be in place during the REDD+ implementation phase. Moreover, donor investment in the REDD+ process has to be made transparent and accountable to the local people.

- New policy interventions: Bhutan has been in the process of changing the following policies and laws in the context of the revised objectives of forest management in line with the REDD+ and other international commitments:

  - National Forest Policy 2011 (revised)

  - Final draft of Subsidized Timber Allotment Policy 2012 (submitted to the Cabinet)

  - Interim Framework for Collection and Management of Non-Wood Forest Products (NWFP)

  - Framework for Wang River Basin Management

  - Access and Benefit Sharing Policy

  - Bio-safety Bill 2013 (submitted to Cabinet)

  - National Renewable Natural Resources Research Policy of Bhutan 2011

- Measures for local/community-level participation: Considering that local people's participation is key to the sustainable management of natural resources, the Royal Government of Bhutan has framed various enabling policies and legislation to ensure public participation, from initial decision making through to implementation, as per the Decentralization Policy of the government. The government acknowledges the potential of REDD+ to deliver significant benefits to local communities living in and around forests and to resource managers involved in conserving and sustainably managing natural resources. The risks associated with the implementation of REDD+ activities to local communities need to be identified, reduced, and mitigated in collaboration with all relevant stakeholders. The REDD+ process requires considerable awareness raising efforts and the capacity building of staff and local communities in identifying the risks and benefits of REDD+ and developing appropriate measures to mitigate the risks (Royal Government of Bhutan 2013).

- Provision for funding (partners/donors): The total budget for the implementation of Bhutan's R-PP is USD 4.61 million. The REDD+ readiness project, which consists of three components, will be supported by a grant of USD 3.80 million from the FCPF. The Royal Government of Bhutan will finance USD 372,000. Bhutan will also receive funding from the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety. Additional funding will be requested from other donors, such as the Bhutan Trust Fund for Environmental Conservation, United Nations Development Programme (UNDP), FAO, Global Environment Facility of the World Bank, UN-REDD Secretariat, Government of Austria, and UNFCCC.

REDD+ pilot projects

Bhutan has not yet implemented any pilot projects. Because no projects have been implemented, estimates of the potential costs and benefits of the emerging REDD+ strategy are extremely speculative. However, at the national level, Bhutan has been conducting forest inventories by taking random samples from different forest types, ranging from sub-tropical cool temperate broadleaf forest, to temperate and sub-alpine forests.

MRV framework

As part of the Cancun Agreement, REDD+ implementing countries have to develop a robust and transparent national MRV system with the capacity to regularly and accurately monitor changes in forest cover and carbon stocks over time (Ravindranath et al. 2012). However, verification standards for REDD+ are lacking in Bhutan. Thus, during the readiness phase, it is proposed to develop national standards and guidelines for independent and transparent verification mechanisms. These standards will outline the verification bodies, processes, and reporting requirements. Capacity building measures, specifically training for government staff, community members, and NGOs on the verification requirements, will be undertaken during the implementation of the R-PP.

Data availability and gaps

Forest monitoring data and information is essential for REDD+. Bhutan has forest data available for 1995 and 2011, but these were collected using different methods (Land Use Planning Project 1995; Ministry of Agriculture and Forests 2011). To update the data, Bhutan is carrying out a fresh national forest inventory, including understorey and ground cover forest biomass measurements. Forest monitoring data and information including forest areas and types, deforestation statistics, forest governance structures, etc., can be shared at the national and international level through a freely accessible web-portal using a GIS mapping interface. Data on changes and improvements to livelihoods and other co-benefits resulting from REDD+ interventions will be collected by relevant government agencies, local communities, and the private sector.

Safeguard mechanisms

Implementation of REDD+ is generally considered to have a positive impact on the environment and society; however, it can also have a negative impact. Thus, safeguard systems are considered critical in global REDD+ discourse to prevent possible harm. A safeguard system helps to identify areas of negative, as well as positive, impacts and possible mitigation measures to boost the positive and reduce the negative impacts. Bhutan shows the highest level of political will and support for conserving forest biodiversity. The Constitution of the Kingdom of Bhutan in Article 5.2(a) states: "The Royal Government shall protect, conserve and improve the pristine environment and safeguard the biodiversity of the country". Similarly, Article 5.3 states that: "The Government shall ensure that, in order to conserve the country's natural resources and to prevent degradation of the ecosystem, a minimum of 60% of Bhutan's total land shall be maintained under forest cover for all the time". These constitutional provisions provide a solid foundation for developing environmental safeguard mechanisms for REDD+ in Bhutan.

Capacity for REDD+ at central and local levels

The implementation of REDD+ in Bhutan requires the capacity development of all stakeholders including local communities, local leaders, members of the local REDD+ committees, and other relevant committees, as well as REDD+ TWG members and staff of the relevant departments and ministries. Capacity building will be required at different levels and on different topics. This will not only ensure the smooth implementation of the R-PP, but will also contribute to the overall capacity building of departments, ministries, and other stakeholders in implementing REDD+ and related programmes in the future.

Future of REDD+

Bhutan has some experience with benefit sharing under payment for ecosystem services (PES) schemes. A PES feasibility study was undertaken by FAO in 2009, which identified certain positive conditions for PES implementation in Bhutan (FAO 2009). As per the recommendations in that study, PES was piloted for three environmental services in three different locations and it is anticipated that these pilots will have a positive impact on REDD+ implementation in the future.

Bhutan foresees various challenges in implementing REDD+. First, there is the challenge of distributing the revenue generated from REDD+ in a transparent and equitable way based on the percentage of forest cover in different dzongkhags (districts or provinces). For this, there is a need for demonstration sites prior to an agreement on REDD+ activities. Awareness and capacity development programmes are powerful tools to engage a wide range of stakeholders in the sustainable management of forest resources. This can be taken as one of the opportunities of REDD+ and such awareness programmes need be organized at the community or village level to sensitize people on the issues of REDD+.

Chapter 3: REDD+ in India

India covers a large area of approximately 3.3 million square kilometres. It has an estimated population of more than 1.2 billion (as of July 2014) and population growth rate of 1.25% (United States Central Intelligence Agency 2014b).

Forest resources

Current forest cover

The current forest and tree cover of India is estimated to be 697,898 km^2, occupying 21.23% of the country's geographical area and consisting of very dense forest (2.54%), moderately dense forest (9.70%), and open forest (8.99%). Most of the country is covered by non-forest area (77.51%), with the remaining 1.26% covered by shrub. India's forest areas were reduced by 5,871 km^2 or 0.18% during the assessment period (2011–2013) (Forest Survey of India 2013). However, it is claimed that policies such as the Forest Conservation Act, 1980 and afforestation programmes such as social forestry and joint forest management, as well as community awareness raising, have contributed to stabilizing forest cover (Ravindranath et al. 2012).

Significance of forests to local livelihoods

There are around 300 million forest dependent people in India, including around 87 million tribes, who derive their livelihoods and substantial parts of their income from forests. Joint forest management, a partnership between local communities and the Forest Department, started in India in the 1990s and has been a successful model, with over

Haridwar, Uttarakhand, India

100,000 joint forest management committees involving around 20 million people in managing over 22 million hectares of forest area. These forests not only provide forest products, such as timber, fuelwood, and fodder, but also supply various ecosystem services and support the livelihoods of millions of forest-dependent people.

Drivers of deforestation and forest degradation

Although, forest cover in India is relatively stable, rates of deforestation and forest degradation vary in different parts of the country and may be higher in certain places (e.g., in Northeast India where shifting cultivation is practised). Furthermore, some authors claim that mono-culture plantations are replacing natural forests, masking the net decrease in forest cover (Puyravaud et al. 2010).

In India, as in other countries in the region, forests and people are closely linked, because millions of people live close to or in forests and protected areas and harvest forest products for their sustenance and livelihoods (Sahoo and Davidar 2013). Population growth and the penetration of market forces are the major drivers of deforestation and forest degradation. Adding to this, extensive shifting cultivation in Northeast India, high population pressure, and high demand for agriculture products are contributing to deforestation (Lele and Joshi 2009; Pattanaik et al. 2011). Likewise, other drivers are the demand and supply gap for forest products, forest fires, overgrazing, illegal felling, and the conversion of forest for development activities. Although there are many factors causing deforestation and forest degradation in India, Davidar et al. (2010) identified the high dependency of people on forest products for their daily needs as the main underlying factor.

Grasslands within protected areas are essential habitat for herbivores, Jim Corbett National Park, Uttarakhand, India

Status of REDD+

REDD+ R-PP

Although India has not yet submitted its R-PP, it has played an important role in shaping the REDD+ mechanism in the international negotiation process (Sharma and Chaudhry 2013). India's position on REDD+ is that emissions must be reduced through conservation, the sustainable management of forests, and enhancing forest carbon stocks, in addition to reducing emissions from deforestation and forest degradation. This position was accepted at COP 13 in 2007 and incorporated in the Bali Action Plan, which guides the current negotiations on REDD+.

At the national level, India has a robust policy and legal framework for the sustainable management of its forests in the form of the Wildlife Protection Act 1972, Forest Conservation Act 1980, National Forest Policy 1988, National Environmental Policy 2006, and Forest Rights Act 2006. Several of these forest-related acts and policies are currently under review. However, the country needs to submit its R-PP and get ready with a national strategy at the earliest, so that it can start implementing REDD+.

Country commitment to implementation

Considering the development of REDD+ at the international level, a gradual implementation approach is needed to help India to prepare its R-PP and get ready for REDD+ (Singh 2013). To this end, India has set up a National REDD+ Cell at the Ministry of Environment, Forest and Climate Change and intends to play a key role in the design and implementation of REDD+ strategies at the national and sub-national levels. This Cell will coordinate and guide REDD+ activities at the national level and engage with the State Forest Departments to collect, process, and manage all REDD+ related information and data.

Establishing REDD+ Cells at the state level is also under consideration; these cells would primarily be involved in overseeing the project preparation and its implementation by joint forest management committees and village forest protection committees. The state REDD+ Cells would also be responsible for making sure that projects are designed in line with the national guidelines. In addition, these cells would organize training and capacity building programmes for REDD+ stakeholders and serve as the main agency for implementing REDD+ programmes at the grassroots levels (Sud et al. 2012).

Apart from setting up a National REDD+ coordinating agency, India has formed a technical group to develop methodologies and procedures to assess and monitor the contribution of REDD+ activities. India has also recently developed its REDD+ policy and strategy (Sud et al. 2012), under which a National Forest Carbon Accounting Programme is being institutionalized (Sarkar 2011).

Institutional setup

The National REDD+ Cell under the Ministry of Environment, Forest and Climate Change is the main body responsible for the development and implementation of national policies related to REDD+. In collaboration with the State Forest Departments, the Cell is tasked with guiding the collection and management of data related to forest carbon accounting and provides technical advice on these matters. The Cell will also guide the development, funding, monitoring, and evaluation of REDD+ activities (Vijge and Gupta 2014).

In addition to the REDD+ Cell, the government has also formed the Indian Network on Climate Change Assessment, which oversees the relationship between climate change and forests. The Forest Survey of India, as the lead institution, together with other governmental institutions, including, among others, the National Remote Sensing Agency and the Indian Council of Forestry Research and Education, are responsible for implementing and monitoring REDD+ activities (Vijge and Gupta 2014).

REDD+ pilot projects

The East Khasi Hills Autonomous District Council and the Meghalaya State Government launched the community-based 'Khasi Hills REDD+ project' in 2011 (Community Forestry International 2013), under the Sixth Schedule of the Constitution of the Government of India. Under this project, Community Forestry International has been supporting the indigenous government of the Mawphlang Hima (a 'hima' is a self-governed indigenous state consisting of several groups of villages) in Meghalaya to improve forest management through indigenous peoples' participation. Ten himas have already formed a federation ('synjuk') to foster this initiative. Plan Vivo (an environmental service certification system for the long-term sequestration or avoided emission of CO_2, with additional livelihood and ecosystem benefits) is engaged with the REDD+ project for certification. This project is one of the first REDD+ projects completely controlled and operated by indigenous people. It has not yet received any financial support from the World Bank, the Forest Carbon Partnership Facility, the Carbon Finance Unit, or any UN sponsored REDD+ initiatives. This project is one of the first initiatives in which indigenous peoples' institutions in Northeast India are working together to develop a landscape-level approach to managing forest resources sustainably for their daily livelihoods and are proactively engaging with restoring their forests, rivers, and watersheds and improving their agricultural techniques (Ghosh 2011; Lang 2011). Community Forestry International is also supporting another REDD+ project in the Naga Hills of Manipur, in Northeast India.

Moreover, the Government of India, in collaboration with the United States Agency for International Development (USAID), has been conducting forest carbon inventories and monitoring and field testing new carbon accounting methodologies and forest management interventions. These activities are targeted at areas where the rate of potential deforestation and forest degradation is high, as well as areas that have the potential for carbon sequestration through improved land management practices (USAID 2010).

MRV framework

India has a mature and well-developed national forest monitoring system based on remote sensing (RS) combined with ground verification. It also has long-term time series data on forest cover for different crown cover. In addition, India has the capacity to detect the area of deforestation, forest degradation, conservation, carbon stock enhancement, and sustainable forest management (Romijn et al. 2012; Vijge and Gupta 2014).

Data availability and gaps

India has an advanced forest inventory system. The Forest Survey of India conducts a biennial cycle of forest and tree cover assessments in every state of the country. Recent studies conducted by Romijn et al. (2012) and Pandey (2012) indicate that India is at an advanced stage and has very good capacity for measuring forest area change and performing regular national forest inventories for growing stock and forest biomass. The data reported for India can be perceived as highly certain, because of its good monitoring capacities. In addition, India has a good set of historical data on its forest area, which enables it to adopt the methodology based on RS and GIS, followed by ground verification.

Although India has the capacity to assess forests using GIS and RS, this capacity only exists at the central level. State-level agencies still do not have adequate capacity. Hence, the technical capacities of the officials of the state REDD+ Cells will have to be developed in using up-to-date GIS and RS technology for forest carbon assessment and for outreach of the REDD+ mechanism at the grassroots level.

Safeguard mechanisms

In India, there are already safeguards in place to protect the customary rights and traditions of tribes, forest dwellers, and other local communities. Provisions in policy and legal instruments, such as the Forest Rights Act 2006 and the Biological Diversity Act 2002, ensure the rights of local communities and enable them to be key players in the local governance of natural resources (Sharma and Chaudhry 2013). However, the country does not have a system for providing information on environmental and social safeguards related to REDD+ (Ravindranath et al. 2012). A clear set of indicators and criteria is desirable in order to effectively monitor safeguards in the context of REDD+.

The Khasi Hills Community REDD+ Project

Mark Poffenberger, Community Forestry International

The Khasi communities of Northeast India have been conserving forests for hundreds of years, as evidenced by their 500-year-old tradition of sacred forests. However, in recent times, these communities have witnessed the rapid degradation and loss of their community forests. From 2000 to 2006, forest loss in the East Khasi Hills District exceeded 5% per year, contributing to deteriorating surface water and groundwater supplies, erosion, and sedimentation problems, as well as perceived changes in the micro-climate. Approximately 39% of forest land in East Khasi Hills was severely degraded as a result of unsustainable fuelwood harvesting, grazing, and fire, as well as quarrying and timber extraction.

These threats to forest ecosystems catalysed 62 villages and ten indigenous governments to establish a federation ('synjuk') to coordinate the protection and restoration of community forests within the 27,000 hectare Umaim sub-watershed. The Khasi Hills Community REDD+ project is a unique and locally-driven response to forest pressure, using innovative financing mechanisms. Indigenous institutions such as multi-village governments ('hima') and tribal village councils ('dorbar') set and enforce traditional social norms and rules through transparent and democratic processes that characterize Khasi society.

The project has resulted in improved fuelwood harvesting rules based on rotation, the adoption of fuel-efficient stoves, changes in animal husbandry systems, and fire controls. The surface mining of coal and limestone are controlled by the himas, which have the authority to oversee leases on community lands in their jurisdiction under the Sixth Schedule of the Indian Constitution. Agreements to limit mining and quarrying leases by the ten himas under the umbrella of the synjuk are helping to reduce the impact of these drivers on deforestation and forest degradation. The new village institutions established under the project, including the synjuk, are learning how to use scientific forest monitoring systems, including remotely sensed data and field-based measurements collected by community members. This initiative is India's first PES/ REDD project to be certified under the international 'Plan Vivo' standard.

Under the REDD+ project framework, the synjuk is implementing a 30-year climate adaptation strategy for the upper watershed. The project is designed to establish an initial ten-year income stream to support the federation. Based on initial projections of the impact of community-based activities to avoid deforestation and forest degradation (avoided deforestation), as well as through forest restoration (sequestration), an additional 20,000–30,000 t CO_2 credits will be generated each year, yielding a gross income of USD 100,000–USD 150,000 annually to finance the synjuk and livelihood activities for participating communities.

Forest rights and social capital in the form of indigenous institutions are present in many of the Sixth Schedule areas of North East India providing an enabling context for the expansion of REDD+. The Community REDD+ Project provides a framework and resources to build management capacities, institute meaningful MRV systems, and establish the long-term flow of funds to support management activities including fire control, energy efficient stoves, reforestation, and livelihood activities. The approach goes well beyond the requirements of 'free, prior, and informed consent', as it not only relies on community-based project planning, but also gives communities complete ownership of the project. In the initial five years of the project (2011–2015), Community Forestry International and other NGOs provided technical guidance and financial support to the federation to establish the project. Now that the project initiation phase is complete, the federation manages all aspects of the project.

Source: Community Forestry International (2013)

Agroforestry (poplar, sugarcane, and rice) practices in the lowlands of Uttarakhand, India

Capacity for monitoring forest resources at central and local levels

The Forest Survey of India has been responsible for the periodic monitoring of national forest resources in India since 1981. State governments also monitor forests at the local and management unit levels. Since 1987, India's forest cover has been monitored at two-year intervals using a wall-to-wall approach that involves assessing the area of the forest cover and any changes to it (Ravindranath et al. 2012). To date, forest cover monitoring has been carried out 12 times (Devendra 2012).

Monitoring is now done using digital interpretation of satellite imagery of 23 m resolution and a mapping scale of 1:50,000. The minimum mappable area is one hectare. About 4,000 sample points are verified to assess the accuracy. Forest cover is classified into three classes of canopy density: very dense (more than 70% canopy density), moderately dense (40–70% canopy density), and open forest (10–40% canopy density) (Forest Survey of India 2013). The Forest Survey of India used Landsat imagery until the fourth assessment in 1993; since then, imagery from Indian satellites (IRS 1A/1B, IRS 1C/ID and IRS P6) has mostly been used (Devendra 2012).

Rain water harvesting pond in Himachal Pradesh, India

The Forest Survey of India followed a Tier 1 approach for a greenhouse gas inventory for the first National Communication submitted to the UNFCCC in 2004, a Tier 2 approach for the second National Communication in 2011, and is planning to adopt a Tier 3 approach for the third National Communication (Devendra 2012). RELs/RLs are a vital component of implementing REDD+. India has a strong advantage of a well-developed national monitoring system. The country has time-series data on historical forest cover for 25 years and forest inventory data for most of the country's forests. The monitoring system has the capacity to locate changes in forest accurately by analysing the historical data (Devendra 2012). In addition, analysis of data clearly allows identification of the drivers of deforestation and forest degradation.

Despite the fact that the Forest Survey of India is using state-of-the-art technology for the assessment of forest resources, the number of technical staff has decreased over time. In addition, given the scope of the work and size of the country, the institution is not large enough to handle all of its activities (Devendra 2012). Information is also lacking on the social and environmental value of forests. The large-scale valuation of ecosystem services and how they support the livelihoods of local communities is lacking.

Future of REDD+

The existing legislative framework, policies and rules – such as the National Forest Policy 1988, Indian Forest Act 1927, Wildlife (Protection) Act 1972, Forest (Conservation) Act 1980, Environment (Protection) Act 1986, and Biological Diversity Act 2002 – in India are supportive of REDD+. In addition, the goals of REDD+ are in agreement with India's National Forest Policy 1988, which aims to ensure environmental stability and the maintenance of the ecological balance through protecting, conserving, and enhancing the existing forests of the country. The Forest (Conservation) Act 1980 regulates the diversion of forest land for non-forestry purposes and provides for compensatory afforestation. Safeguarding the rights of local communities is also addressed in the National Forest Policy, as well as in the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act 2006. The prior consent of local communities (through the Gram Sabha) is mandatory before a proposal for the diversion of forests is approved by the central government. Thus, the existing policy framework supports the implementation of REDD+.

Chapter 4: REDD+ in Myanmar

Myanmar has total land area of 676,578 km². The topography of Myanmar can roughly be divided into three parts: the Western Hills, the Central Valley, and the Eastern Hills (Government of Myanmar 2013).The population of Myanmar is estimated to be 55.7 million with a population growth rate of 1.03% as of July 2014. About 70% of the population live in rural and remote areas (Government of Myanmar 2013).

Forest resources

Current forest cover

Myanmar has a diversity of landscapes, supporting a variety of forest types with distinct vegetation compositions. Forest types can be grouped into six broad categories: dry forest, coastal forest (with sub-categories of mangrove or tidal forest, beach and dune forest, swamp forest), tropical evergreen forest, mixed deciduous forest (with sub-categories of moist upper mixed deciduous forest, lower mixed deciduous forest, dry upper mixed deciduous forest), hill and temperate evergreen forest (with sub-categories including pine forest), and Indaing forest (with the sub-category of deciduous dipterocarp forest) (Government of Myanmar 2013).

Teak forest plantation, Yedashe Township, Nay Pai Taw Union Council, Myanmar

Myanmar's permanent forest estate (PFE) is divided into reserved forests, protected public forests, and protected areas. These forests are managed by the government under the Ministry of Environmental Conservation and Forestry. PFE currently covers approximately 30.73% of the total land area (Table 2), but the Forest Policy 1995 envisages 40% forest coverage in the country (Government of Myanmar 2013).

Table 2: **Status of permanent forest estate in Myanmar**

Category	Area (ha)	% of land area	% targeted land area (forest policy)
Reserved forest	12,184,291	18.00	30
Protected public forest	4,094,960	6.05	
Protected area*	3,510,685	6.67	10
Permanent forest estate	19,789,936	30.73	40

Source: Planning and Statistics Division, Forest Department 2010
* By September 2012 there were 36 notified protected areas (33 terrestrial and three aquatic).

With an estimated forest cover of 47% of the total land area (FAO 2010), the above figures show that a substantial area of forest is not classified as PFE. Furthermore, it is expected that as much as 50% of PFE no longer qualifies as 'forest' due to long-term agricultural encroachment. A recent presidential decision has recommended the revision of the boundaries of the PFE to reflect this ground reality. This would reduce the real PFE to approximately 15% of the total land area, leaving over 30% of the total land area as unclassified forest. To reach the PFE policy target of 40% would still be feasible, but would require the accelerated gazetting of remaining forest. It would also require the sustainable management and protection of the increased forest area under PFE, which would be challenging considering the steady deforestation rates and ongoing forest degradation in Myanmar. The Forestry Policy 1995 recognizes that the management of state forests needs to be reconsidered and that local communities and, where appropriate, the private sector, need to be involved as key partners in managing forest resources.

Significance of forests to local livelihoods

Since 1988, Myanmar has moved to a more liberal and market-oriented economy, opening up to foreign investment. Agriculture, livestock, fisheries, and forestry jointly contribute more than 50% of the national GDP and about 30% of export earnings. The forestry sector's contribution to GDP is less than 1%, but timber exports alone contribute 10% of total exports. Myanmar's forests are also socially and economically significant to the country. Over 70% of the population lives in rural areas and is highly dependent in forest resources such as food, fodder, fuelwood, and timber (Government of Myanmar 2013).

Drivers of deforestation and forest degradation

Between 1925 and 1989, Myanmar's forest cover decreased from 65.8% to 50.8% of the total land area. However, since 1989, forest cover has increased, reaching 52.4% in 2004, an increase of 1.6% in 15 years. According to the Forest Resources Assessment (FAO 2010), the loss of overall forest cover was 5.5% of the total land area from 2004 to 2010. This corresponds to a total loss of around 3.7 million hectares. The annual deforestation rate of 1.1% from 2004 to 2010 indicates that forest cover is now declining at a far higher

Table 3: **Forest cover in Myanmar at different periods**

Year	Forest cover (ha)	% of total land area	% of closed forest (crown cover>40%)
1925	44,518,700	65.8	n/a
1955	38,700,300	57.2	57.0
1975	35,665,600	52.7	47.8
1989	34,370,100	50.8	43.2
1997	35,374,700	52.3	37.4
2004 (FAO 2005)	35,478,000	52.4	27.3
2010 (FAO 2010)	31,773,000	46.9	19.9
Total land area	67,658,000	100	

rate than at any time previously. Several sources indicate an accelerating loss of closed forest due to continuous forest degradation (Table 3). Despite these negative and accelerating deforestation and forest degradation trends, the Forest Resources Assessment (FAO 2010) indicates that Myanmar is still endowed with a substantial forest area covering about 47% of the country's total land area of nearly 67.7 million hectares.

Patch of deforestation, Shan State, Myanmar

The drivers and underlying causes of deforestation in Myanmar are similar to those in other developing countries (unsustainable illegal or legal logging, fuelwood collection, and pioneering or unsustainable shifting cultivation). In Myanmar, the main drivers of deforestation have been categorized into two groups, i.e., drivers of deforestation inside the forestry sector and drivers of deforestation outside the forestry sector. The drivers of deforestation inside the forestry sector include the overexploitation of forest timber (legal-illegal), overharvesting of wood biomass as a source of energy, unstable or pioneering shifting cultivation, forest fires, overgrazing, storms, and pests. The drivers of deforestation outside the forestry sector are the expansion of agriculture (subsistence and commercial), mining, hydropower development, infrastructure (roads, pipelines, special economic zones, and transmission lines), urbanization and resettlement, and the development of aquaculture.

The growing population and increasing demand for food, wood products, and other commodities from domestic and international markets is exerting additional pressure on the remaining forest resources and driving rapid land use change in favour of agriculture and industry. This situation is further exacerbated by a vicious cycle of poverty, heavy reliance on increasingly scarce common access resources such as forests and other natural resources, low agricultural productivity, and the lack of alternatives for rural populations. Poor forest governance and law enforcement, conflicting institutional mandates, unclear policy frameworks, limited natural resources management capacities, and insufficient financial resources all have major repercussions for deforestation and forest degradation. The lack of secure tenure over forests and forest lands is a major obstacle to local and community participation, as well as long-term investment in forest management.

Status of REDD+

REDD+ R-PP

Since mid-2010, UN-REDD has supported Myanmar by sharing information on REDD+ and providing resource persons for national REDD+ meetings. Myanmar joined the UN-REDD Programme in December 2011 (Government of Myanmar 2013). In July 2012, the Government of Myanmar, in collaboration with national and international stakeholders, commenced development of its REDD+ Readiness Roadmap, which was submitted to the FCPF in August 2013 (Government of Myanmar 2013). The REDD+ Readiness Roadmap development process was led by the Forest Department's Planning and Statistics Division and the multi-stakeholder TWGs, which included most members of the Afforestation and Reforestation (A/R) Clean Development Mechanism and REDD+ Core Unit. The Government of Myanmar received both financial and technical support from the Government of Norway, FAO, UN-REDD, United Nations Environment Programme (UNEP), and Department for International Development (DFID) for preparation of the roadmap. The REDD+ Technical Advisor is supporting the implementation of roadmap activities for the development of Myanmar's National Forest Monitoring System (NFMS) and REL/RLs for REDD+. The initial REDD+ multi-stakeholder network, established in 2010/11, was enlarged through the in-depth REDD+ stakeholder analysis undertaken by the 'Stakeholders and Safeguards' TWG during the development phase. This allowed for much wider participation in different national and regional consultation workshops organized to review and validate the REDD+ Roadmap (Government of Myanmar 2013).

Institutional setup

National Environment Conservation Committee (NECC) is the existing central level committee for guiding, reviewing, and endorsing REDD readiness annual plans. In addition, it reviews and endorses the proposed changes and harmonization of institutional, financial, and policy/legal frameworks for REDD implementation in Myanmar. Under the overall guidance of an existing multi-sectoral NECC chaired by MOECAF, REDD Taskforce will manage and coordinate the REDD readiness process. The taskforce consists of representatives of the Ministry of Environmental Conservation and Forestry (MOECAF), Ministry of Agriculture and Irrigation, and Ministry of Home Affairs Myanmar Environmental Rehabilitation-Conservation Network. Under the chair of the Forest Department of the MOECAF, the taskforce will be further supported by three existing and three additional multi-stakeholder technical working groups. In addition there is a REDD+ Taskforce Office within the Planning and Statistics Division of the Forest Department. This office will provide the necessary secretarial, managerial, operational, and technical support to the taskforce (Figure 2).

Country commitment to REDD+ implementation

Myanmar's commitment to the implementation of REDD+ can be measured by its commitment to improving governance for REDD+, new policy interventions for REDD+, measures for local and community level participation, and provision for REDD+ funding.

- Improvement of governance: Governance measures address existing gaps or inefficiencies in the implementation framework for REDD+. As mentioned in the REDD+ Roadmap, all REDD+ activities will be supplemented with governance mechanisms that ensure the sustainability of the REDD+ implementation process.
- New policy interventions: Although regulations relevant to the implementation of REDD+ strategies are generally in place, focused policy and legal framework reviews, within and outside the forestry sector, are needed to provide an opportunity to verify whether or not the laws and regulations of Myanmar allow for REDD+ strategies to be implemented (Government of Myanmar 2013).
- Measures for local/community-level participation: The REDD+ stakeholder analysis undertaken by the 'Stakeholders and Safeguards' TWG during the roadmap development phase allowed for the participation of community level stakeholders in the different national and regional consultation workshops on the REDD+ Roadmap (Government of Myanmar 2013).

Shifting cultivation, Shan State, Myanmar

Figure 2: **Institutional arrangements for REDD+ in Myanmar**

National Environment Conservation Committee (NECC)

REDD+ Taskforce:

Ministry of Environmental Conservation and Forestry

Ministry of Agriculture and Irrigation

Ministry of Home Affairs

Myanmar Environmental Rehabilitation-conservation Network

REDD+ Taskforce Office, Forest Department

TWG TWG TWG TWG TWG TWG

REDD+ Stakeholder Network
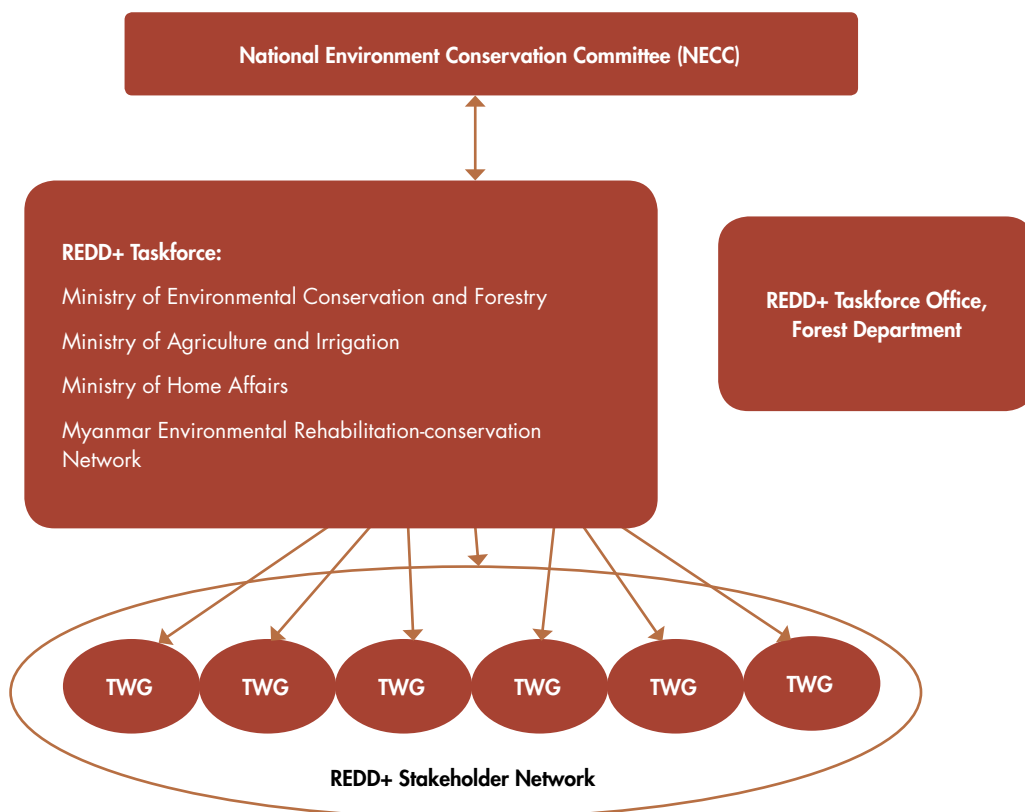
Source: Government of Myanmar 2013

- Provision for funding (partners/donors): The Government of Norway and UN-REDD provided funding for the preparation of Myanmar's REDD+ Readiness Roadmap. Technical support was provided by UN-REDD, the Centre for People and Forests (RECOFTC), other government organizations, civil society organizations, and the private sector, which were involved in the different technical working groups while drafting the roadmap. Moreover, since 2015, Myanmar has received funding from the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety.

REDD+ pilot projects

Although Myanmar has not yet started a REDD pilot project, an assessment on the readiness of the major components of REDD+ has been conducted in cooperation with UNDP and local NGOs (Government of Myanmar 2013). As part of the REDD+ Roadmap preparation phase, three TWGs on Drivers and Strategy Development, Stakeholder Engagement and Safeguards, and National Forest Monitoring System and REL/RL were formed and convened meetings. The National Forest Monitoring System and REL/RL TWG were assigned the tasks of identifying and documenting the existing data and technical systems to further identify the capacity building gaps and needs.

Community forest project near Bagan, Mandalay Region, Myanmar

Data availability and gaps

The Forest Department, under the Ministry of Environmental Conservation and Forestry, is the authorized government institution for using RS and GIS in Myanmar. There are RS/GIS facilities in the Land Survey Department, Ministry of Environmental Conservation and Forestry, Land Settlement and Records Department, Ministry of Agriculture and Irrigation, Ministry of Science and Technology, and Ministry of Transportation. The Forest Department's RS/GIS section in the Planning and Statistics Division was established in 1980 when satellite remote sensing was introduced by an FAO/UNEP project. The use of PC-based Arc/Info GIS was initiated in 1993 by the National Forest Management and Inventory Project. The major activities of the RS/GIS Section are forest cover assessment at various scales and using various satellite data sources, the preparation and management of a national GIS database, and the preparation of various maps for land use management, biomass assessment, and forest fire assessment (Government of Myanmar 2013).

Forest carbon stock data has not yet been collected through the National Forest Inventory. Data on national forest carbon stocks is confined to academic research carried out by the Forest Research Institute. This is a major data gap for the development of national and sub-national RELs/RLs, which will be addressed through the development and implementation of the country's National Forest Monitoring System (Government of Myanmar 2013).

MRV framework and safeguard mechanisms

The REDD+ Readiness Phase must put in place the capacities, infrastructure, and systems necessary to conduct accurate national forest inventories, monitor forest cover and cover change, and carry out monitoring, reporting, and verification of forest-based greenhouse gas emissions. The REDD+ implementation framework includes the social and environmental frameworks within the REDD+ programme (Government of Myanmar 2013).

Capacity at central and local levels

A comprehensive and continuous process of learning is necessary for the key REDD+ institutions and grassroots stakeholders to successfully engage in REDD+ readiness activities. This will contribute to the scaling up of REDD+

Community forest, Yedashe Township, Nay Pai Taw Union Council, Myanmar

implementation activities. An ongoing, reflective learning process needs to be developed to provide each institution and group of stakeholders with the competencies, skills, and knowledge required to fulfil their role in the REDD+ programme (Government of Myanmar 2013).

Future of REDD+

The REDD+ Readiness Roadmap development process was led by the Forest Department's Planning and Statistics Division and the multi-stakeholder TWGs, which included most members of the Afforestation and Reforestation Clean Development Mechanism and REDD+ Core Unit. The existing REDD+ multi-stakeholder network, established in 2010–2011, has been enlarged through the in-depth REDD+ stakeholder analysis undertaken by the 'Stakeholders and Safeguards' TWG during the roadmap development phase. This has allowed for much wider participation in different national and regional consultation workshops organized to review and validate the REDD+ Roadmap (Government of Myanmar 2013).

Myanmar has adopted a three-phased approach to implement REDD+ in the country. Phase 1, Phase 2 and Phase 3 encompass readiness, implementation, and performance-based payments, respectively. Myanmar is currently under Phase 1, seeking to accomplish activities to prepare for the implementation of the REDD+ Roadmap. This entails necessary frameworks, capacities, and institutions to implement REDD+ at the national level are in place. Myanmar expects Phase 1 to be completed in four years starting from 2014. The implementation in Phase 2 will involve more field-level testing through demonstration activities that shows the cost-effective results at a national scale without undermining REDD+ safeguards. Phase 2 may further require capacity building and the development of new policies and legislation. The country will fully enter Phase 2 when all readiness activities have been completed, within two years of the completion of the roadmap. Myanmar will start to implement REDD+ activities through national performance based system on Phase 3. This will take place after the successful implementation of Phase 1 and 2 (Government of Myanmar 2013).

Chapter 5: REDD+ in Nepal

Nepal is a small landlocked country with an area of 147,181 km². Although it occupies only around 0.03% of global land, it is spectacularly diverse in topography, which ranges from 70 to 8,848 masl. The estimated population is nearly 31 million (July 2014), with a population growth rate of 1.82% (United States Central Intelligence Agency 2014d).

Forest resources

A complete inventory of the forest resources of the country has never been conducted, hence, forest cover data varies across the different reports and studies available. The National Biodiversity Strategy and Action Plan (2014) and other government documents (Ministry of Forests and Soil Conservation 2002) have identified 118 ecosystem types and 35 forest types in this small country. According to the Department of Forest Research and Survey (1999), inventoried forest occupies about 29% of Nepal's total area and shrub land another 11%. Agricultural land makes up 21%, non-cultivated land 7%, and grassland 12%. Forest inventories indicate a decrease in forest cover over the last four decades. Table 4 illustrates the extent of forest cover and deforestation from 1964–1999.

The national forest inventory of 1999 found that from 1978–1994 the annual deforestation rate was 1.7% (Department of Forest Research and Survey 1999). Another study by the Central Bureau of Statistics (2008)

Chitwan National Park, Chitwan District, Nepal

Table 4: **Forest and shrub land cover in Nepal (1964–1999)**

Report	Year	Forest area (ha)	Forest cover (%)	Shrub land (ha)	Shrub (%)	Forest and shrub total (ha)	Forest and shrub total (%)
Forest Resources Survey	1964	6,402,000	45.5	-	-	6,402,000	45.5
Land Resource Mapping Project	1979–1989	5,616,000	38.1	689,000	4.7	6,285,000	42.8
Master Plan for the Forestry Sector	1985–1986	5,424,000	37.4	706,000	4.8	6,210,000	42.2
National Forest Inventory	1999	4,268,000	29.0	1,560,000	10.6	5,828,000	39.6

Source: Acharya et al. 2012 and Paudel et al. 2013

estimated that 84,000 hectares of forest was deforested annually from 1991–2001. Likewise, the Department of Forest Research and Survey (2014) found that Nepal's average deforestation rate was 1.63% from 1990–2005. The study also revealed that the Terai forest has declined by 16,500 hectares within the last nine years (2001–2010). Similarly, the forest cover loss was found to be about 32,000 hectares within the same period. The annual rate of decrease in forest cover was 0.44% and 0.40% during the periods 2001–2010 and 1991–2010, respectively (Department of Forest Research and Survey 2014).

Significance of forests to local livelihoods

Forests provide a wide range of products including household goods, cultural goods, physical and biological products, and other services, which are important for livelihoods. In Nepal, forests have been one of the key components for rural livelihoods. Fuelwood and fodder are the basic forest products extracted on a daily or weekly basis in most of the rural areas in Nepal. More than two-thirds of the fuelwood required and more than 50% of the fodder for livestock are extracted from forests (Balla et al. 2014).

Drivers of deforestation and forest degradation

Deforestation and the degradation of forest have been observed for a long period in Nepal; however, the rate of degradation and deforestation varies across management regimes and geographical regions (Paudel et al. 2013). The highest rate of deforestation is recorded in the Terai region (the plains adjoining India), whereas the lowest rate is in the high mountains. Deforestation and forest degradation also occur in the middle hills, but is kept at a medium level by community forestry programmes.

Many factors contribute to deforestation and forest degradation in Nepal. Nepal's REDD Readiness Preparation Proposal (R-PP) has identified the following drivers of deforestation: high dependence on forests, illegal and unsustainable harvesting, overgrazing, forest fires, resettlement, forest encroachment, infrastructure development, and invasive species (Government of Nepal 2010).

Reasons for deforestation in the Terai include resettlement programmes, unauthorized settlements, the illegal clearing of forests for agriculture, and the illicit felling of timber to be smuggled across the border. Other factors causing deforestation and degradation in the Terai include the expansion of agricultural land for food production, collection of fuelwood for cooking and heating, forage collection for livestock and forest grazing, inadequate management of public forests, and restrictive forest management regulations. The continuous political instability over a decade and a half and lack of land use planning are other reasons for deforestation. Forest fires and disturbances due to floods and landslides are other significant factors.

A study carried out by the REDD Forestry and Climate Change Cell (2012) identified six proximate and five underlying causes of deforestation and forest degradation in the high mountain region. The proximate causes are forest fires, overgrazing, the indiscriminate extraction of products, infrastructure expansion, and the development of new economic frontiers, whereas the underlying causes are demographic factors, policy and institutional factors, economic factors, and research and development factors (Government of Nepal 2010).

Table 5: **Drivers of deforestation and forest degradation**

Proximate causes	Underlying causes
Illegal logging	Increased demand for forestland and forest products
Fuelwood consumption	High dependency on forests
Encroachment	Lack of a deliberative and inclusive forest policy process
Road construction	Poor transparency and corruption
	Weak law enforcement
	Weak land tenure
	Prolonged political transition and instability
	Social differentiation and inequality
	Population growth
	Migration, pressure on resources and related Conflicts
	Limited access to improved technology

Source: UN-REDD 2014

A comprehensive study by UN-REDD (2014), which builds on previous work in the R-PP, identified four proximate and 11 underlying causes of deforestation and forest degradation in Nepal (Table 5).

Status of REDD+

REDD+ R-PP

Nepal was one of the first countries to receive REDD+ funds from the FCPF for REDD+ readiness and is now completing the readiness process with the preparation of the R-PP document. Toward this end, Nepal must develop its baseline reference level as per the Good Practice Guidelines of the Intergovernmental Panel on Climate Change (IPCC). The Government of Nepal is concurrently developing a reference level at national and sub-national levels. At the national scale, it is designing a national framework for establishing a baseline reference level, as well as an MRV system at a coarser level, using country-specific remote sensing data and published emission factors, but without field data collection or verification. At the sub-national level, the government is piloting a cutting-edge technology, using a combination of Light Detection and Ranging (Lidar) data, field vegetation plots, official government data, and satellite data, to develop a baseline carbon stock map and reference level for the Government of Nepal's designated Emission Reduction Program Area, which includes 12 districts of the Terai Arc Landscape. The area consists primarily of lowland habitats, with some district boundaries extending to the Siwalik Hills.

The World Bank, upon the request of the Government of Nepal, extended the FCPF Readiness Fund Grant Agreement for 18 months (from January 2014 to June 2015). The extension was made for two reasons. First, so Nepal could complete ongoing studies for REDD+ readiness and, second, to allow for the development of a performance-based REDD+ programme at the sub-national level to enable Nepal to access potential opportunities under the FCPF Carbon Fund. During the extended period of REDD+ readiness, some analytical studies and activities towards achieving REDD+ readiness at the national level and the development of performance-based piloting for the FCPF Carbon Fund in the Terai Arc Landscape were carried out. Nepal's Emission Reduction Program Idea Note was selected by the World Bank in its ninth Carbon Fund Meeting held in Brussels, and the country is now in the process of developing an emissions reduction programme document.

Institutional set up

In order to coordinate and guide REDD+ related activities in Nepal, the Ministry of Forests and Soil Conservation has established an REDD+ Cell (the REDD Implementation Centre), which facilitates the development and implementation of national policies related to REDD+. In addition to this, two other multi-sectoral committees – the Apex Body and REDD Working Group – have been established. The Apex Body is an inter-ministerial institution that ensures multi-sectoral coordination and cooperation for the planning and implementation of REDD activities at

Figure 3: **Institutional structure for REDD+ governance in Nepal**

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                              ┌─────────────────────────────┐
  ┌ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─│        APEX Body            │
  ·                           │ Chaired by the Minister of  │
  ·                           │   Forests and Soil          │
  ·                           │      Conservation           │
  ·                           └─────────────────────────────┘
  ·  ┌─────────────┐          ┌─────────────────────────────┐
  ·  │    REDD     │· · · · · │    REDD Working Group       │
  ·  │ Multi-      │          │ Chaired by the Secretary,   │
  ·  │ Stakeholder │          │ Ministry of Forests and     │
  ·  │   Forum     │          │   Soil Conservation         │
  ·  └─────────────┘          └─────────────────────────────┘
  ·                           ┌─────────────────────────────┐
  · · · · · · · · · · · · · · │ REDD Implementation Centre  │
                              │ Led by the Joint Secretary, │
                              │ Ministry of Forests and     │
                              │   Soil Conservation         │
                              └─────────────────────────────┘
              ┌──────────────┐        ┌──────────────┐
              │ Finance and  │        │ Experts in   │
              │administrator │        │ REDD related │
              │              │        │   topics     │
              └──────────────┘        └──────────────┘
                        ┌──────────────────────────────────┐
                        │ Policy and programme development │
                        └──────────────────────────────────┘
                        ┌──────────────────────────────────┐
                        │ Monitoring, reporting, and       │
                        │ verification                     │
                        └──────────────────────────────────┘
                        ┌──────────────────────────────────┐
                        │ Communication and outreach       │
                        └──────────────────────────────────┘
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the highest level. The Apex Body encompasses top-level officials from nine government ministries and the National Planning Commission. The REDD Working Group is under the leadership of the Secretary, Ministry of Forests and Soil Conservation, which ensures the representation of different forestry-related stakeholders. Figure 3 depicts the governance structure for REDD+ implementation in Nepal at the central level.

Country commitment to REDD+ implementation

The Government of Nepal has demonstrated consistent commitment to conserve and manage Nepal's natural heritage. It has engaged consistently in international trainings and negotiations, including with the UNFCCC, in which Nepal, as the coordinator for least developed countries, has played an important role in coordinating all 49 least developed countries on climate change issues. Nepal's commitment to the implementation of REDD+ can be measured by its commitment to improving governance for REDD+, new policy interventions for REDD+, measures for local and community level participation, and provision for REDD+ funding

- Improvement of governance: The government's commitment to REDD+ was initially demonstrated through the establishment of a three-tiered institutional structure for REDD+, which includes the Apex Body, the REDD Working Group, and the REDD Cell. This formal structure is supplemented by two informal bodies, the REDD Multi-Stakeholder Forum and the REDD+ Civil Society Organizations and Indigenous Peoples Organizations Alliance Nepal. These groups meet routinely to address major REDD+ issues and make decisions. The Government of Nepal considers REDD+ as one of its highest-priority programmes, and its progress is monitored by several sectors including by the Ministry of Forests and Soil Conservation up to the level of the Minister, and by the National Planning Commission, Office of Prime Minister, and Council of Ministers.

- New policy interventions/research and development: Activities envisaged under REDD+ implementation are harmonized with various other development priorities of the government, notably:

- Nepal's Low Carbon Economic Development Strategy (2014) aims to identify key approaches to drive Nepal towards a low carbon development path while fostering economic growth opportunities. It lists forestry as one of six leading sectors to promote low carbon growth.
- The National Land Use Policy (2012) supports classifying land to optimize long-term use and commits to maintaining 40% forest cover nationally.
- Nepal's Agro-biodiversity Policy (2007) also deals with the conservation and sustainable utilization of agri-related bioresources.
- The Draft Agriculture Development Strategy, which is yet to be endorsed, also has a fully-integrated REDD+ agenda for the agriculture sector.
- Nepal's Three Year Plan (2013–2015) includes as a priority the development of institutional infrastructure to capture the benefits of REDD+ implementation.
- The Approach Paper (2013) and the Ministry of Forests and Soil Conservation's vision of 'Forestry for Prosperity' envision the expansion of sustainable forest management practices, as proposed in the Emission Reduction Program Idea Note.
- Nepal's National Biodiversity and Action Plan (2014–2020) envisages that the REDD+ approach will produce synergies for biodiversity conservation in the country.

- Measures for local/community-level participation: It envisions and ensures participation of local people and communities' participation in REDD+ process.
- Provision for funding (partners/donors): Apart from the FCPF, Nepal is also receiving financial assistance from other donor agencies. The main donor agencies supporting REDD+ in Nepal are UN-REDD, the Multi Stakeholder Forestry Programme (supported by the United Kingdom, Swiss, and Finnish governments), and the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety. In addition, USAID provides direct support for the REDD+ Readiness Programme in Nepal.

REDD+ pilot projects

At present, there are five REDD+ related projects being implemented in Nepal. The focus of these projects, which are being implemented at the national level, is awareness raising, capacity building, and the development of methodologies. A list of these ongoing projects with their focus areas is presented in Table 6.

Type of pilot	Institutions	Objectives	Implementation unit
REDD+ payment system	ICIMOD, Federation of Community Forestry Users, Nepal (FECOFUN), Asia Network for Sustainable Agriculture and Bioresources (ANSAB)	Establishment of a Forest Carbon Fund, designing MRV system	Watershed based
Poverty alleviation through REDD+ pilot	World Wide Fund for Nature (WWF), Nepal	Developing standard method of forest carbon measurement and generating forest carbon data	Landscape
Grassroots capacity building for REDD project in Nepal	The Center for People and Forests (RECOFTC)/Norwegian Agency for Development	Raising awareness at grassroots level	Community forest user group (CFUG)s in 18 districts
Climate change adaptation	Swiss Development Cooperation, DFID	Explore adaptation & mitigation activities to address the impacts of climate change	Community forest users
Capacity building of local indigenous communities	Nepal Federation of Indigenous Nationalities (NEFIN)	Create awareness about REDD+ focusing on indigenous peoples	Local indigenous people
Awareness raising for collaborative forest users	Netherlands Development Organisation (SNV), Nepal	Create awareness in Terai about climate change& REDD	Mahottari District

Source: REDD Forestry and Climate Change Cell (2011)

Panchase, Kaski District, Nepal

Pilot project on REDD+ payment system

ICIMOD has been engaged in community carbon forestry projects since 2003, with the support of the Directorate-General for International Cooperation (DGIS), Government of the Netherlands, working in India and Nepal. ICIMOD, together with ANSAB and FECOFUN, implemented a REDD+ pilot project 'Design and setting up a governance and payment system for Nepal's community forest management under REDD+' from 2009 to 2013, supported by the Climate and Forest Initiative of the Government of Norway. ICIMOD also contributed to the capacity building of REDD+ stakeholders in Pakistan between 2012 and 2013 in partnership with UNDP/One UN, the Inspector General Forest, and WWF Pakistan.

The main achievements of this pilot project were:

Local community forest user group member measuring forest carbon

- Measured forest carbon in 105 CFUGs of three watersheds in Nepal involving community user groups
- Established a Forest Carbon Trust fund that monitors carbon data, which received the community forest's claim form and comprised a group of advisory and monitoring committees
- Set up a watershed-level benefit sharing mechanism considering incremental carbon stock (against the baseline) and social safeguards (with local communities that conserve and manage their community forests)
- Provided yearly incentives to motivate communities to conserve forest
- Identified the main drivers of deforestation and forest degradation in the three watersheds and set up alternatives to reduce deforestation and forest degradation (e.g., installed alternative energy systems to reduce community dependency on forests, established forest fire lines, and planted saplings on bare land)
- Raised community awareness about addressing the impacts of climate change and the mitigation measures that communities can adopt

A pilot project on the establishment of a REDD+ payment system was implemented by the consortium of ICIMOD, ANSAB, and FECOFUN. The project started in 2009 with financial support from the Norwegian Agency for Development and ended in 2013 (REDD Forestry and Climate Change Cell 2011). The primary goal of the project was to pilot a REDD+ payment mechanism in community-managed forests in three watersheds of Nepal to support the long-term goal of establishing a national demonstration payment mechanism for carbon credits in community forests (Maraseni et al. 2014).

The immediate outcome of the project was the initiation of the development of a framework for REDD+ strategies at the national and local levels so that the model demonstrated could be readily scaled up when the REDD+ payment mechanism was officially launched. The project was piloted to learn about the various aspects of REDD+ implementation, such as baseline information, methodologies for carbon measurement, and benefit sharing mechanisms at the national level.

The learning from the pilot project has contributed to the development of carbon measurement guidelines, development and distribution of REDD+ related outreach materials, assessment of the trade-offs between carbon benefits and their opportunity costs, and guidance for policy makers on how to design an incentive-based REDD+ project (REDD Forestry and Climate Change Cell 2011; Maraseni et al. 2014). Moreover, the impact assessment for the project found that incentives do create some positive social and environmental impacts in Nepal (Maraseni et al. 2014; Poudel et al. 2014).

MRV framework

A recently completed study on developing a MRV system for Nepal suggested refining the existing organizational set up for REDD+ to include a separate MRV division with four independent, but closely connected, sections or units: forestry inventory, reporting, RS/GIS, and database/IT/metadata. Nepal's R-PP earlier envisaged that the Department of Forest Research and Survey would lead the measurement and MRV activities (see Figure 4) (REDD Forestry and Climate Change Cell 2013b).

Given the diversity of forest conditions in the different physiographic and development regions, a sub-national level institutional and technical arrangement for REDD and MRV is essential (REDD Forestry and Climate Change Cell 2013b). Similarly, diversity in the drivers of deforestation and degradation in terms of intensity, rate, and impact across the regions also requires sub-national level arrangements. Thus a nested approach to REDD+ implementation is desirable. Under a nested approach, the sub-national level MRV system would remain integrated with the central-level MRV (REDD Forestry and Climate Change Cell 2013a).

Figure 4: **Proposed MRV section management set up in Nepal (REDD Forestry and Climate Change Cell 2013)**
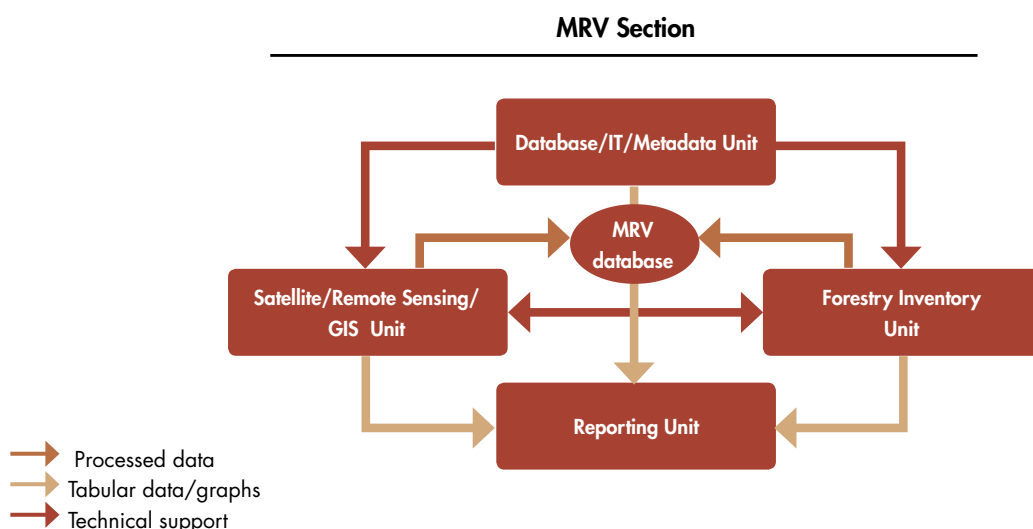
Table 7: Possible areas for monitoring and data gaps

Area for monitoring	Existing practices	Identified gaps
Deforestation	Satellite images and aerial photographs of different scales and resolutions	Remote sensing data are mostly in medium or high resolution form Remote sensing data are received from external sources Methods used for each periodic inventory are not the same, resulting in inventories not being able to be compared
	Field inventory adopting grid-based systematic sampling	Variation in sampling design for each inventory Different output variables considered in each inventory Drivers of deforestation ignored
Forest degradation	Selective felling monitoring: measured in gross methods of GIS inventory	Need for more specific monitoring
	Forest fire monitoring (on a case-by-case basis)	Need a specific monitoring mechanism Lack of mechanism to detect fire Lack of forest-fire zoning
	Grazing impact monitoring (existing practices ignore this)	Not considered in previous forest inventories Hard to determine methodology for monitoring grazing impact
	Insect pests and diseases damage monitoring (rarely done)	Need for more specific monitoring
	Other natural hazard impacts monitoring (not part of the National Forest Inventory in Nepal)	Lack of data on forest loss by natural hazards Difficulty to delineate natural hazards in forest cover maps Carbon stock loss not considered
Carbon stock	Although national forest inventories have not considered carbon stock calculation, an attempt has been made to estimate growing stocks using algometric equations	Specific measures required to monitor the carbon stock change as suggested by the IPCC Good Practice Guidelines Lack of time-series data on biomass growth for most of species
Co-benefits		Social and environmental services are not covered in the existing structure for forest monitoring and reporting.

Peacock in Chitwan National Park, Chitwan District, Nepal
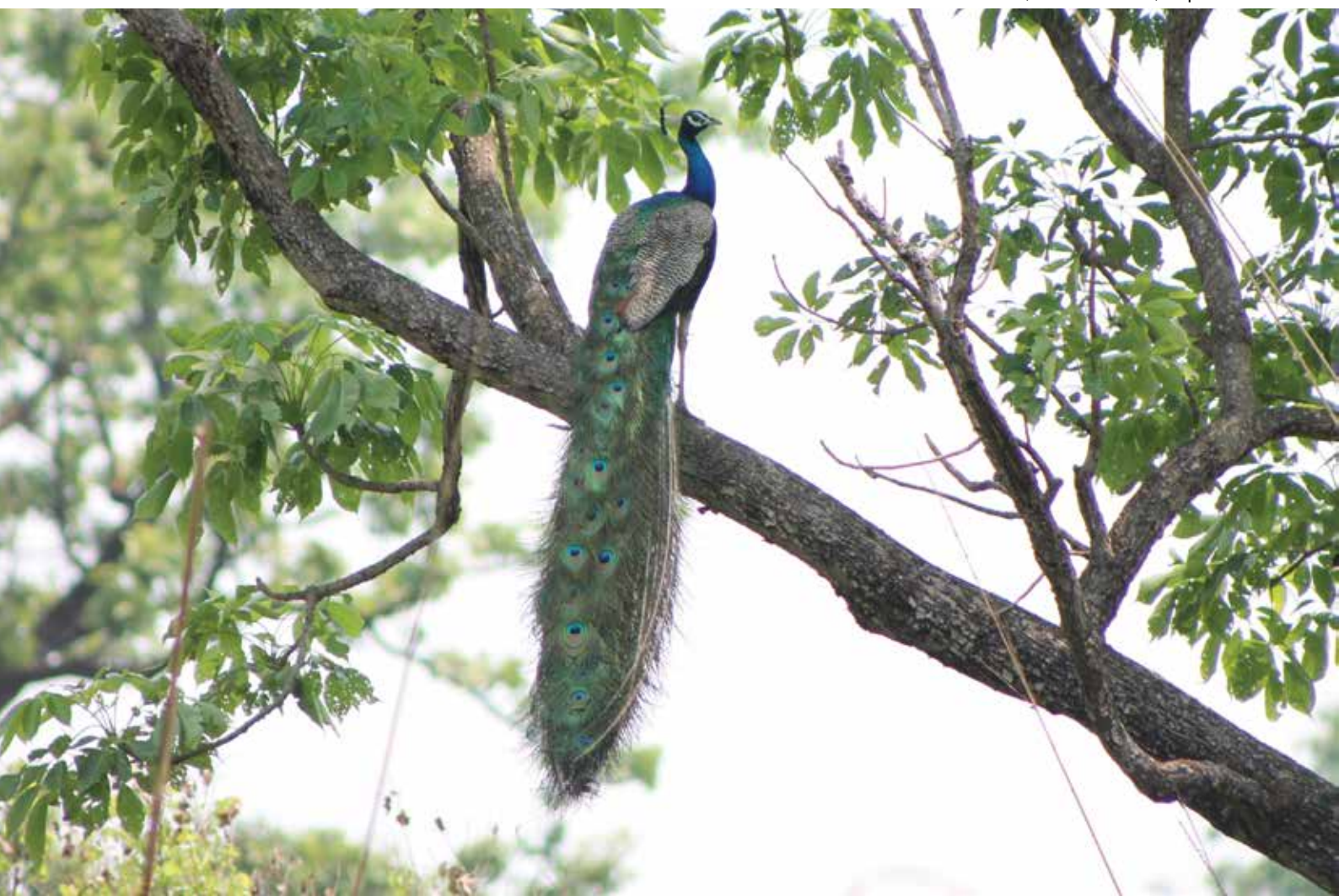
Data availability and gaps

The IPCC Good Practice Guidelines has three tiers for measuring and recording deforestation and forest degradation with different levels of accuracy. The IPCC suggests using the higher tier for measuring and recording REDD+ activities. The higher tier requires more data and is likely to be more expensive, because it involves measuring and recording local variables. Countries can adopt any tier based on available financial resources and technical capacities. Nepal has adopted the second tier and is developing its capacity for the third. Jha and Paudel (2010) identified a range of possible areas for monitoring and the respective data gaps (Table 7).

Romijn et al.(2012) also identified large capacity gaps in Nepal's current monitoring system. The capacity gaps were identified based on the four assessment categories: national engagement of a country with REDD+ processes; existing monitoring capacities for monitoring forest cover and carbon stock changes; challenges faced in the REDD+ process; and remote sensing technical challenges. Although Nepal has a high level of engagement in the REDD+ process, large gaps can be observed in its greenhouse gas inventory capacity and use of remote sensing technology. Major capacity building efforts are needed to bridge the current capacity gaps if a REDD+ mechanism is to be implemented (Government of Nepal 2010; Lyster 2011).

Safeguard mechanisms

Various safeguards systems/standards for REDD+ have been put in place at various scales in Nepal. The most widely used standards in Nepal are the Cancun Safeguards of the UNFCCC, the FCPF Safeguards of the World Bank, standards from UN-REDD, and the REDD+ Social and Environmental Standards (SES) (Khanal and Poudyal 2013). Nepal's R-PP mentions that Nepal will be piloting the REDD+ Social and Environmental Standard (SES) and will use these as a clearinghouse for all information on REDD+ (Government of Nepal 2010), which will ensure the implementation of REDD+ social safeguards in policies and practices. Nepal, being an FCPF-supported country, is also focusing on the World Bank's safeguards policy, namely, the Strategic Environmental and Social Assessment (SESA) and Environment and Social Management Framework (ESMF).

Nepal has completed the process of SESA, which includes the ESMF. It has developed REDD+ SES Nepal indicators with the initiation of a Climate, Community and Biodiversity Alliance. Development of a monitoring plan and the assessment of indicators are underway. Towards this, Nepal undertook a joint mission in 2011 to initiate the SES process and identify synergies with the development process of SESA. The challenge for Nepal is the integration of these two safeguards in the REDD+ programme, because the SESA is mandatory in the R-PP whereas the SES is voluntary.

Foresters visiting the scientific forest management plot in Rupandehi District, Nepal

Nepal is also moving forward in designing a safeguard system. Although there are no clear guidelines for designing a safeguard system, some basic elements are: policies, laws and regulations; a safeguards information system (SIS); and a grievance and redress mechanism. Accordingly, Nepal has initiated a study on these elements. Based on the outcome of the study, a national safeguards information system is expected to be established.

Capacity for REDD+ at central and local levels

Adequate technical capacity of staff of government and non-governmental agencies is essential to implement REDD+. However, various studies have indicated that the technical capacity in Nepal is inadequate, both at government and non-governmental levels (Jha and Paudel 2013; REDD Forestry and Climate Change Cell 2013a).

The potential of REDD+ in the Baghmara Buffer Zone Community Forest

Nabin Bhattarai, ICIMOD

Situated at the northern border of Chitwan National Park, the Baghmara Buffer Zone Community Forest was heavily degraded in the 1970s and 1980s following the nationalization of forest and eradication of malaria in the southern Terai of Nepal. In 1990, recognizing the importance of conservation and the usefulness of natural resources in livelihoods, the locals gathered to protect and conserve the forest and its biodiversity leading to the beginning of the community conservation of this forest. On 26 June 1995, this forest was officially handed over to the community user group as the Baghmara Buffer Zone Community Forest under Forest Act 1993. The forest covers an area of 215 hectares, of which 163 hectares was naturally regenerated through community efforts. This forest user group consists of 956 household members and more than half the members are Tharus (one of the indigenous groups of the area) who have been involved in conserving and managing the forest since 1990s. According to the President of the Baghmara Buffer Zone Community Forest, more than 300 tourists enter the forest during the tourism peak season in a single day. As forest management activities, the user groups used to thin, clean, and prune the forest, as well as cut the grass and plant trees. In terms of grassland management, the user groups cut and cleared the woody vegetation.

Conservation with development

The main source of income for the group was the entrance and operation fee charged by the community. The group's annual income for the fiscal year 2014/2015 was USD 280,000, which the user group invested in the sustainable management of the forest, biodiversity conservation, community development, and poverty alleviation.

The Hariyo Ban project

With funding support from USAID, WWF implemented the 'Hariyo Ban' project together with FECOFUN, the Cooperative for Assistance and Relief Everywhere (CARE-Nepal), and the National Trust for Nature Conservation. Hariyo Ban works in two important geographical locations in Nepal – the Terai Arc Landscape and Chitwan-Annapurna Arc Landscape. It has three core interwoven components: biodiversity conservation, payment for ecosystem services including REDD+, and climate change adaptation. The main aims of the project are to:

- Reduce the threats to biodiversity in the Terai Arc Landscape and Chitwan-Annapurna Arc Landscape

- Build the structures, capacity, and operations necessary for effective sustainable landscape management, especially REDD+ readiness

- Increase the ability of targeted human and ecological communities to adapt to the adverse impacts of climate change

Table 8: **Forest area of community forests where the ICIMOD REDD pilot project was implemented (2009–2013)**

SN	Watershed (district)	Community forest name	Total community forest area (ha)	Area in dense strata (ha)	Area in sparse strata (ha)
1	Charnawati (Dolakha)	Charnawati	819.35	733.67	85.67
2	Charnawati (Dolakha)	Bhitteri	542.64	377.67	164.97
3	Charnawati (Dolakha)	Setidevi Dadar	421.71	192.63	229.08
4	Charnawati (Dolakha)	Dhande Singhdevi	343.69	229.51	114.18
5	Charnawati (Dolakha)	Shankadevi	305.26	247.4	57.86
6	Charnawati (Dolakha)	Srijana	264.2	209.9	54.29
7	Charnawati (Dolakha)	Tharlange	203.97	183.92	20.05
8	Charnawati (Dolakha)	Eklepakha	197.33	157.83	39.58
9	Charnawati (Dolakha)	Golmeshor	215.18	100.95	114.23
10	Charnawati (Dolakha)	Majhkharka Lisepani	174.18	145.73	28.44
11	Charnawati (Dolakha)	Botlesetidevi	172.1	113.69	58.42
12	Charnawati (Dolakha)	Napkeyanmara	152.46	82.56	69.9
13	Charnawati (DolaJha)	Gairi Jungle	131.08	125.98	5.11
14	Charnawati (Dolakha)	Jugedarkha	125.6	101.5	24.1
15	Charnawati (Dolakha)	Sitakunda	141.31	15.72	125.59
16	Charnawati (Dolakha)	Thansa Deurali	124.37	59.08	65.29
17	Charnawati (Dolakha)	Bhakare	104.43	76.26	28.17
18	Charnawati (Dolakha)	Kopila	96.07	88.24	7.83
19	Charnawati (Dolakha)	Salleri	92.27	26.69	65.58
20	Charnawati (Dolakha)	Jyamire	70.01	58.38	11.64
21	Charnawati (Dolakha)	Kamalamai	71.81	15.31	56.5
22	Charnawati (Dolakha)	Chyanedada	64.86	33.07	31.79
23	Charnawati (Dolakha)	Timure Tinsalle	67.1	23.49	43.62
24	Charnawati (Dolakha)	Pauwa	58.64	41.92	16.72
25	Charnawati (Dolakha)	Charnawati 1	55.12	43.12	11.99
26	Charnawati (Dolakha)	Mahabhir	50.26	48	2.26
27	Charnawati (Dolakha)	Lodini	50.67	46.64	4.03
28	Charnawati (Dolakha)	Simpani	64.4	8.05	56.35
29	Charnawati (Dolakha)	Bhumethan Shivajung	46.67	16.71	29.97
30	Charnawati (Dolakha)	Chhitakunda	51.51	0	51.51
31	Charnawati (Dolakha)	Dimal	38.2	34.66	3.54
32	Charnawati (Dolakha)	Bichaur	47.71	7.29	40.42
33	Charnawati (Dolakha)	Devithan	43.94	14.36	29.58
34	Charnawati (Dolakha)	Mahankal Sahele	39.38	26.69	12.69
35	Charnawati (Dolakha)	Thumkadada	40.78	20.56	20.22
36	Charnawati (Dolakha)	Budabhimsen	41.97	9.12	32.85
37	Charnawati (Dolakha)	Kuprisalleri	42.03	1.61	40.42
38	Charnawati (Dolakha)	Sanobothle	35.06	18.27	16.79
39	Charnawati (Dolakha)	Barkhe Dadapari	35.4	11.61	23.78
40	Charnawati (Dolakha)	Laliguras	35.53	10.33	25.2
41	Charnawati (Dolakha)	Chyanse Bhagawati	30.32	23.82	6.5
42	Charnawati (Dolakha)	Mathani	28.28	22.52	5.77
43	Charnawati (Dolakha)	Simsugure	33.35	3.87	29.47
44	Charnawati (Dolakha)	Pokhari	23.6	18	5.6
45	Charnawati (Dolakha)	Gothpani	23.5	17.4	6.09
46	Charnawati (Dolakha)	Maithan Harisiddi	28.35	3.51	24.85

47	Charnawati (Dolakha)	Dhade	29.17	0.17	29.01
48	Charnawati (Dolakha)	Kalchhe	21.49	16.34	5.14
49	Charnawati (Dolakha)	Thutemane	23.6	8.63	14.97
50	Charnawati (Dolakha)	Ramite	13.6	13.17	0.43
51	Charnawati (Dolakha)	Sundarimai	12.98	4.51	8.47
52	Charnawati (Dolakha)	Bhasmepakha	10.93	6.16	4.77
53	Charnawati (Dolakha)	Palung Mahila	10.28	0.32	9.96
54	Charnawati (Dolakha)	Chuchhedhunga	8.9	0	8.9
55	Charnawati (Dolakha)	Amalekharka Community Forest	6.6	1.51	5.09
56	Charnawati (Dolakha)	Bhirmuni Devithan	5.98	0	5.98
57	Charnawati (Dolakha)	Gahate Baghkhor	5.54	0.19	5.35
58	Charnawati (Dolakha)	Palekoban	1.49	1.03	0.45
59	Charnawati (Dolakha)	Sele Alambir	57.3	22.8	34.53
60	Charnawati (Dolakha)	Ghattapakha	6.1	6	0.08
61	Charnawati (Dolakha)	Kuktung Khola	12.6	9.2	3.4
62	Charnawati (Dolakha)	Nursery Pakha	5.8	2.8	3.01
63	Charnawati (Dolakha)	Setokhola Mahasthan	7.6	4.2	3.44
64	Charnawati (Dolakha)	Radhakrishna	5.6	4.6	0.95
65	Charnawati (Dolakha)	Chitreshwor Mahadev	3.1	0.2	2.92
66	Kayarkhola (Chitwan)	Nibuwatar	329.2	315.2	14.0
67	Kayarkhola (Chitwan)	Chitramkaminchuli	314.0	233.1	81.0
68	Kayarkhola (Chitwan)	Deujar	278.9	184.1	94.8
69	Kayarkhola (Chitwan)	Devidhunga	189.1	152.0	36.1
70	Kayarkhola (Chitwan)	Chelibeti	64.8	59.6	6.2
71	Kayarkhola (Chitwan)	Kalika	213.8	206.2	7.6
72	Kayarkhola (Chitwan)	Indreni	172.2	155.6	16.6
73	Kayarkhola (Chitwan)	Batauli	155.8	91.3	64.5
74	Kayarkhola (Chitwan)	Dharapani	147.2	142.2	5.0
75	Kayarkhola (Chitwan)	Janapragati	118.8	97.2	21.7
76	Kayarkhola (Chitwan)	Pragati	115.5	70.8	44.7
77	Kayarkhola (Chitwan)	Kankali	91.6	78.5	13.1
78	Kayarkhola (Chitwan)	Samfrang	63.9	26.8	37.1
79	Kayarkhola (Chitwan)	Satkanya	58.3	56.0	2.3
80	Kayarkhola (Chitwan)	Jharana	34.5	23.5	11.1
81	Kayarkhola (Chitwan)	Jamuna	34.5	10.9	23.7
82	Ludikhola (Gorkha)	Ludi Damgade	270.71	221.44	49.28
83	Ludikhola (Gorkha)	Ghaledanda Ranakhola	181.66	146.56	35.09
84	Ludikhola (Gorkha)	Gangate Bahunechaur	173.62	156.79	16.83
85	Ludikhola (Gorkha)	Bhalukhola	107.59	106.48	1.1
86	Ludikhola (Gorkha)	Kuwadi	92.27	83.75	8.52
87	Ludikhola (Gorkha)	Taksartari	89.31	83.08	6.23
88	Ludikhola (Gorkha)	Birienchok	83.57	69.88	13.69
89	Ludikhola (Gorkha)	Thokane Bhanjyang	76.18	73.54	2.65
90	Ludikhola (Gorkha)	Baghepani	68.16	67.55	0.6
91	Ludikhola (Gorkha)	Lamidanda	61.59	58.98	2.61
92	Ludikhola (Gorkha)	Siraute	60.34	56.2	4.14
93	Ludikhola (Gorkha)	Kyamundanda	58.72	56.6	2.12
94	Ludikhola (Gorkha)	Mahalaxmi	63.96	38.05	25.92

95	Ludikhola (Gorkha)	Shikhar Bhanjyang	55.49	55.4	0.1
96	Ludikhola (Gorkha)	Sandan Bisauni	50.62	48.65	1.98
97	Ludikhola (Gorkha)	Kharko Pakho Bekhpari	51.15	44.35	6.8
98	Ludikhola (Gorkha)	Chisapani	50.04	45.15	4.88
99	Ludikhola (Gorkha)	Shikhar	50.84	42.47	8.38
100	Ludikhola (Gorkha)	Kharkandepakha	47.82	45.82	2
101	Ludikhola (Gorkha)	Goldanda	45.99	45.63	0.36
102	Ludikhola (Gorkha)	Shikhar Danda	30.36	16.28	14.09
103	Ludikhola (Gorkha)	Badahare	25.78	10.69	15.09
104	Ludikhola (Gorkha)	Punche	18.13	15.44	2.69
105	Ludikhola (Gorkha)	Ludi	17.44	5.75	11.69
106	Ludikhola (Gorkha)	Ram Laxman	13.25	12.78	0.47
107	Ludikhola (Gorkha)	Laxmi Mahila	8.72	8.09	0.63
108	Ludikhola (Gorkha)	Patal Chanpe Mahila	8.16	7.44	0.72
109	Ludikhola (Gorkha)	Anapswanra Bhawanipakha	9.14	4.21	4.93
110	Ludikhola (Gorkha)	Sitalu Pakha	5.69	4.12	1.57
111	Ludikhola (Gorkha)	Bhangeristan Ghantari	5.24	3.15	2.09
112	Ludikhola (Gorkha)	Majhi Khola Simredanda	6	0.33	5.67

Table 9: **Carbon dioxide equivalent sequestered in community forests under the ICIMOD REDD+ pilot project (2010–2013)**

Watershed	Community forest area (ha)	Number of community forests	Population	Total carbon dioxide equivalent $tCO_2 e$ (2010)	Total $tCO_2 e$ (2011)	Total $tCO_2 e$ (2012)	Total $tCO_2 e$ (2013)	Total stock increment (2013–2010)
Charnawati	5,996.21 (98.1)*	58 (plus 7 handed over during project period)	42,609 (4,681)*	4,554,109	4,605,703	4,690,599	4,753,766	199,657
Kayarkhola	2,382	16	23,223	2,521,500	2,533,620	2,554,337	2,579,804	58,304
Ludikhola	1,888	31	23,685	1,448,638	1,485,419	1,505,546	1,534,016	85,378
Total community forest area under REDD Project	10,364	112	94,198	8,524,246	8,624,742	8,750,483	8,867,586	-

* Additional respective data acquired after handing over the new community forest to the CFUGs.
Source: ICIMOD et al. 2010, 2011, 2012, 2013

A recent study conducted by Romijn et al. (2012) describes Nepal's capacity for measuring forest area change and performing a regular national forest inventory on growing stock and forest biomass as low. Adding to this, the different forest and ecosystem types may have different carbon sequestration potential, which demands customized methodologies and formulas for carbon assessment (Paudel et al. 2013). Tables 8 and 9 show the number and area of community forests under REDD pilots and the total carbon dioxide equivalent sequestered.

The rural poor depend on forest resources, Chitwan National Park, Chitwan District, Nepal

Future of REDD+

Complexities related to forest tenure and inadequate capacity for measurement, reporting, and verification are some of the challenges in REDD+ implementation in Nepal. The drivers of deforestation and forest degradation are not only located inside the forestry sector, but many are also outside the forestry sector. The land, water, and associated natural resource-related policies and programmes of different sectors, although essential for the country's economic growth and development, can have a remarkable effect on forests and carbon emissions (REDD Forestry and Climate Change Cell 2013a). Cross-sectoral coordination among government bodies and institutions in sectors associated with REDD implementation is need for REDD+ to be implemented effectively in Nepal.

The governance and institutional set up of Nepal's forestry sector may weaken the implementation of REDD+ in the country (Paudel et al. 2013). Political instability over the last two decades has hampered long-term planning in the forestry sector. The major forestry sector plans and programmes, such as the Forestry Sector Master Plan, which ensured the long-term management of the forestry sector, has already expired. The absence of a long-term forest programme has created a vacuum for effective REDD+ implementation.

The reliable measurement, monitoring, reporting, and verification of REDD+ activities is another challenge for a country like Nepal, where technical human resources are limited. Nepal does not have a periodical forest measurement and monitoring system – and the development of such a system does not seem possible in the near future (Romijn et al.2012; Jha and Paudel 2013). Without continuous periodic measurement, effective REDD+ implementation is unlikely. The country's undulating terrain may also be a challenging in implementing REDD+, as the steep and variable mountain slopes make it is difficult to collect and interpret data, particularly as technical and financial resources are limited (Paudel et al. 2013).

However, there are also numerous opportunities for implementing REDD+. Nepal has a successful history of community-based forest management over the last three decades, which has had positive social and environmental impacts; community-based forest management also has a stable institutional set up that can be used for REDD+ (Poudel et al. 2014). Under these circumstances, reducing the drivers of deforestation and forest degradation and the enhancement of forest carbon and sustainable management of forests is more likely (Maraseni et al. 2014).

Chapter 6: REDD+ in Pakistan

Pakistan has an area of 796,095 km². Its estimated population in July 2014 was 196,174,380, and it had a population growth rate of 1.49% (United States Central Intelligence Agency 2014e).

Forest resources

Current forest cover

The Government of Pakistan statistics state that about 4.392 million hectares are under forest (5.01% of the total land area). The forest resources of Pakistan are deteriorating, both qualitatively and quantitatively, and the annual change rate was -1.8% from 1990 to 2000, increasing to -2.1% from 2000 to 2005. A wide variety of forest and vegetation types are found in different parts of the country, including conifer, juniper, scrub, riverine, and mangrove forests, and there are irrigated plantations in Punjab and Sindh provinces. Pakistan is mainly a dry land country, with 80% of its land in arid and semi-arid areas. The current rate of deforestation of natural forests is 27,000 hectares per year. There is a serious threat of accelerated deforestation and forest degradation in many parts of the country in the wake of rising population and associated demand for wood, weak governance of tenure, encroachment, and land cover changes, which are superimposed by the adverse impacts of climate change (Government of Pakistan 2013).

Khaplu Valley, Gilgit-Baltistan, Pakistan

From a tenure point of view, there are two main categories of forest: state owned and private. State owned forest is legally categorized into five classes: State, Reserved, Protected, Un-classed, and Resumed land. Private forestland has been classified as Guzara Forest, Communal Forest, Section 38 areas, and Chos Act areas. In addition to forest resources, Pakistan has vast rangeland and pasture land areas. From the coastal zone to alpine areas there are seven main range land types: grasslands, grass-wood lands, grass-shrub lands, grass-forbs lands, woodlands, shrub lands, and forbs lands (Government of Pakistan 2013).

Significance of forests to local livelihoods

In Pakistan, there is a wide range of social and cultural setups in the different rural eco-zones (mountains, plateaus, plains, deserts, and coastal areas). The common characteristic is the traditional dependence of rural communities on natural vegetation. In Pakistan, 65% of the population live in rural areas and depend on wood as a primary source of fuel and construction materials. Therefore, finding ways to maintain and increase forest resources is highly relevant to the country. High reliance on forests for wood products adds to land degradation, which in turn increases susceptibility to disasters, such as landslides and flash floods (Robledo et al. 2010).

Rural dwellers located close to natural forests, whether they are legal owners, legitimate rights holders, or non-rights holders, all enjoy multiple uses of forests. They depend to varying degrees upon forests for construction wood, fuelwood, grazing, and many other uses. Medicinal and aromatic plants and other non-timber forest product (NTFPs) are used by local communities. Communities living away from forests purchase forest products, such as fuelwood, wild fruits, and medicinal plants, from the market (Nasir 2012). Recently, there has been a rising realization of the importance of REDD+ as a means of conserving and enhancing forest cover, forest area, and carbon stocks. REDD+ is gradually being seen as an important tool for saving natural forests and stopping forest degradation.

Drivers of deforestation and forest degradation

Pakistan has a low level of forest cover and high rate of deforestation, mainly because of high population pressure. The causes of deforestation and forest degradation in Pakistan include illegal logging and the collection of fuelwood, fodder, and timber; population pressure; lack of land use planning; the extension of housing colonies, settlements, and industry; landslides and erosion; and salinity and water-logging. Other drivers are drought and floods, pests and disease, overgrazing and livestock pressure, migration, the construction of roads and other physical infrastructure, mining, forest fires, poverty and lack of livelihood activities, and lack of proper harvesting and transportation techniques in mountainous areas. Invasive species in dry areas, such as eucalyptus, mesquite, paper mulberry, and lantana, are also causing deforestation and forest degradation (Government of Pakistan 2013).

According to the R-PP, direct drivers of deforestation and forest degradation have been categorized into three groups: demand and consumption of forest products, land use change, and natural or manmade hazards (Government of Pakistan 2013). Regarding the demand and consumption of forest products, the demand for fuelwood is the most critical driver of deforestation and forest degradation, followed by timber smuggling, then fodder demand and open grazing. Comparing the direct drivers of deforestation and forest degradation, demand for timber leading to timber cutting is a serious issue in all forest types, except for mangrove forest as mangrove wood is not very useful as timber. Demand for fuelwood and fodder and grazing pressure are the most severe direct drivers in all forest types.

Mining as a driver is most severe in scrub forests, followed by moist temperate forest, riverine and dry temperate forests. Infrastructure development and forest land encroachment as drivers are most severe in scrub and moist temperate forests, while in riverine and dry temperate forests these drivers are of moderate severity. Agricultural expansion is severe in all forest types, except for mangroves, where such practices are impractical due to salinity. Drought is a severe driver in scrub forests, and to a less extent in dry and moist temperate forests, followed by riverine forests. Floods are a severe driver of deforestation and forest degradation in riverine forests, less severe in scrub and moist temperate forests, and even less in dry temperate forests. Disease and fires are found in all forest types, but are of low severity.

Status of REDD+

REDD+ R-PP

Pakistan submitted its R-PP to the Forest Carbon Partnership Facility (FCPF) of the World Bank on 31 July 2013 (Government of Pakistan 2013) and is in discussion with the relevant provincial departments to initiate the process of REDD+ in Pakistan. Pakistan has also submitted a concept paper for the financing of REDD+ to the Global Environment Facility (UNDP) for its consideration under the mandate of Sustainable Forest Management.

Specific progress on REDD+ in Pakistan includes the following:

- A National Steering Committee on REDD+ has been established.
- REDD+ national and provincial focal points have been notified.
- Pakistan is a member of the UN-REDD programme and FCPF of the World Bank.
- A project identification form for a Global Environment Facility grant has been prepared.
- A One UN Joint Programme on the Environment and UNDP funded project titled, 'REDD+ Preparedness Phase for Pakistan', for capacity building on REDD+ has already been successfully implemented by ICIMOD in Pakistan.
- A Pakistani delegation regularly participates in different international and regional conferences and workshops on REDD+.
- Joint forest management committees and community-based organizations have been organized.
- Trainings and capacity building in REDD+ are ongoing activities.

Institutional setup

The Office of the Inspector General of Forests, which is housed within the Climate Change Division, is mandated to review the REDD+ progress and to plan activities for the future. Provincial focal points have been designated in all provinces to coordinate with the national focal point and the concerned provincial authorities to undertake REDD+ activities in their respective territories. There is active consideration underway to establish a REDD Facilitation Unit to assist the National Focal Point in implementing fully-fledged REDD+.

A National Steering Committee on REDD+ was constituted in 2011 that includes provincial representation. The Prime Minister's Task Force on Climate Change was formed to assess the impact of climate change on Pakistan and initiate the development of a National Climate Change Policy, which was approved by the Government of Pakistan in 2012. This policy provides a framework for addressing the issues that Pakistan faces, or will face in the future, due to the changing climate. The National Climate Change Policy 2012 focuses on the protection and conservation of forest resources and accessing support like FCPF and UN-REDD for this purpose.

A landslide degrades forest patches, Gilgit-Baltistan Province, Pakistan

Country commitment to REDD+ implementation

Pakistan's commitment to the implementation of REDD+ can be measured by its commitment to improving governance for REDD+ and new policy interventions for REDD+.

- Improvement of governance: REDD+ is closely connected with the governance of forest management. Many critical issues of deforestation and forest degradation like illegal logging, encroachment,

Figure 5. **Institutional structure for REDD governance in Pakistan (Government of Pakistan 2013)**
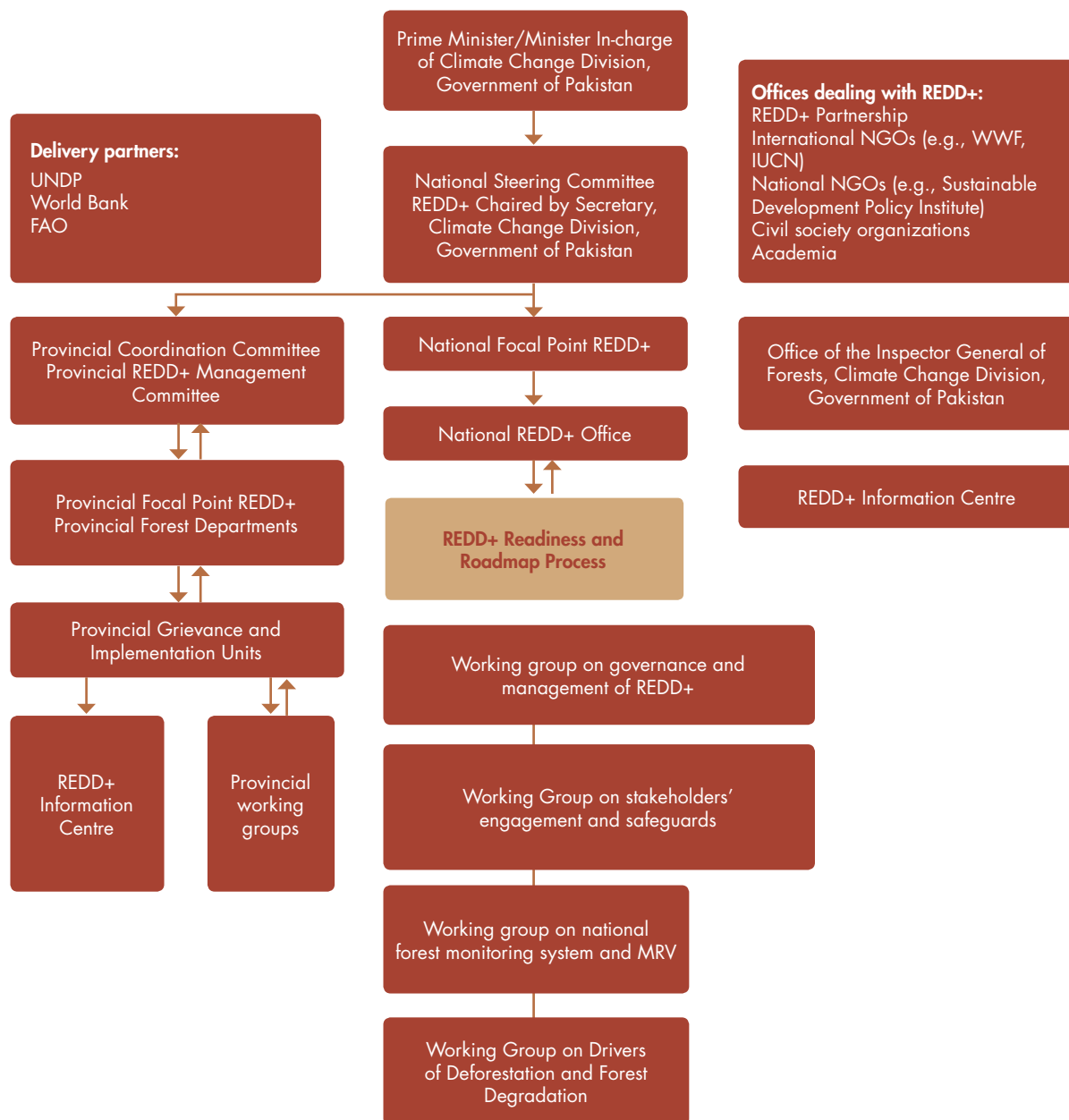
and the conversion of forest land for non-forest uses are due to, or exacerbated by, lack of land use planning and robust policies by the Government of Pakistan. Although several attempts have been made, a draft of the National Forest Policy is still awaiting approval from the Cabinet.

• New policy interventions/research and development: The Government of Pakistan is in the process of preparing its National Development Vision 2025 and 11th Five Year Plan 2014–2019. The period of the five year plan overlaps with the period for R-PP implementation. The plan itself envisages undertaking REDD+ related projects and activities as provided in Pakistan's National Climate Change Policy (Government of Pakistan 2013).

REDD+ pilot projects

The Climate Change Division, under the Government of Pakistan, launched a REDD+ Preparedness Project in May 2012 with financial assistance from UNDP through the One UN Joint Programme on the Environment. The Office of the Inspector General of Forests provided overall guidance to execute this REDD+ project, while ICIMOD and WWF-Pakistan acted as implementing agencies. The goal of the project was to initiate an REDD+ preparedness phase and provide a basis for developing the national REDD+ strategy. The project further aimed to raise

awareness and build the capacity of all stakeholders in REDD+ concepts and the pre-requisites for implementing REDD+ programmes; identify the capacity building needs of stakeholders in the context of REDD+; and prepare a full-scale national REDD+ project proposal. The major output of the REDD+ project was the R-PP, which contains a budget for REDD+ readiness in Pakistan and proposed interventions. The next step is for the World Bank to assist Pakistan to put in place the institutional arrangements for REDD+ (Government of Pakistan 2013). The Government of Pakistan plans to link its ongoing national and donor-funded natural resource projects with REDD+.

MRV framework

The Government of Pakistan plans to develop a monitoring system for multiple benefits, impacts, governance, and safeguards (MBIGS) in order to have a complete understanding of all the relevant dimensions of forest policies and REDD+ in Pakistan. The monitoring of MBIGS is a novel concept for Pakistan, and both government and non-governmental institutions will be engaged in the process to document a wide range of issues and concerns about reduced emissions and enhanced forest carbon. For example, provincial governments will monitor non-NTFPs on a limited scale, organizations like the Pakistan Council of Research on Water Resources will monitor water resources and water quality, federal and provincial environmental protection agencies will monitor air quality data, and universities, research institutes, and NGOs will monitor socioeconomic data. The International Union for Conservation of Nature (IUCN) and WWF-Pakistan will monitor biodiversity data and different government departments will monitor socioeconomic and physical infrastructure data (Government of Pakistan 2013).

REDD+ National Consultation Workshop in Islamabad

The MBIGS will be monitored through the National Forest Monitoring System. This specifically includes forest-based multiple benefits (e.g., an increase in NTFP production and harvesting), land-based impacts (e.g., desertification control, erosion control, and watershed protection), and several of the safeguards (e.g., protection of natural forests and biodiversity, full and effective participation of indigenous peoples and local communities, displacement of emissions, and emission reversals).

The REDD+ Preparedness Phase Project: Laying the groundwork for Pakistan's future REDD+ strategy

The 'REDD+ project: Preparedness Phase for Pakistan' was formally inaugurated by the Secretary of the Climate Change Division during the second meeting of the National Steering Committee on REDD+ in May 2013. This is the foremost project on REDD+ in Pakistan and is jointly implemented by the Climate Change Division, ICIMOD, UNDP, and WWF Pakistan. The prime goal of the project is to lay the groundwork for Pakistan's future REDD+ strategy. The REDD+ project went through an extensive consultation and participation process focusing on capacity building and the sensitization of stakeholders. The pertinent inputs from the stakeholders' consultations were incorporated into the Readiness Preparation Proposal (Government of Pakistan 2013), which delineates the current scenario and recommends the framework for REDD+ implementation at the national and sub-national levels. The R-PP, which was the major output of the REDD+ project, contained an expenditure plan of USD 3.8 million for REDD+ readiness in Pakistan, and was submitted to the World Bank's Forest Carbon Partnership Facility. The proposed interventions have been approved by FCPF and now the World Bank will assist Pakistan to put in place the institutional arrangements for REDD+. The REDD+ preparedness project was a successful chapter that provided strategic direction and a platform for various national, regional and international partners to support REDD+ readiness in Pakistan.

REDD+ National Consultation Workshop, Islamabad, Pakistan

A national consultation process with broad participation (including central and provincial governments, representatives of tribal groups, civil society organizations, NGOs, and academic institutions) will be conducted to establish the MBIGS to be included in the monitoring system. It is expected that there will be a common set of safeguards under the MBIGS, which will be monitored country-wide, as well as multiple sets of regionally-specific safeguards, depending on forest type, socioeconomic conditions, and forest resource utilization.

Data availability in Pakistan is unknown, but expected to be low. Pakistan faces similar constraints as other countries in the region regarding the capacity and resources for collecting data on forest cover and carbon emissions.

Safeguard mechanisms

The Government of Pakistan has taken various safeguard measures into consideration to prevent the potential adverse impacts of REDD+ activities on all stakeholders. In this process, the Strategic Environmental and Social Assessment (SESA) will help to set out a specific process to avoid negative impacts and enhance positive or 'additional' REDD+ benefits in Pakistan. Existing national forest information systems will be harmonized and integrated into a national forest monitoring system in line with the development of RELs and RLs. The consultation process will be carried out to ensure the relevancy and reliability of data collected from all stakeholders.

Capacity for REDD+ at central and local levels

Capacity building activities are included in the work plan for each component for which significant external technical expertise have been used in the R-PP development process. This group of experts from both the government and the non-governmental sectors at national and provincial levels will be responsible for facilitating trainings to develop lead facilitators/trainers at the national and provincial levels. The R-PP states that major activities such as thematic training of trainers, district level trainings, orientation workshops for media persons, capacity development support for forestry and other academic institutions, and the development of training curricula and manuals will be carried out for the capacity building of human resources both from government and NGO sectors (Government of Pakistan 2013).

Future of REDD+

Meeting the daily subsistence needs of forest dwellers, settlement of tenure issues between the government and the people, and improved legislation to recognize the rights and obligations of various stakeholders (including the right to forest carbon) are some of the challenges for the sustainable management of forests in Pakistan. However, the improved governance of natural resources is the largest challenge. Other challenges include: lack of all-inclusive, binding agreements on climate change and REDD+; a large population with high dependence on forests; a subsistence rural economy with lack of alternative livelihood and employment opportunities; 'excessive' requirements for fuelwood and construction wood; multiple and, at times, conflicting demands on forests; high incidence of poverty; low literacy rates; low priority and investment in the forestry sector; the arid environment in large parts of the country; land tenure problems; gender issues and lack of participation by women; leakages and activity shifting problems; displacement of emissions; and the risk of non-permanence and reversals. In addition, there is a general lack of awareness about REDD+ among policy makers, planners, the general public, community members, forestry professionals, the media, and academia, as well as knowledge and technology gaps and other capacity problems, foremost among which are institutional and governance weaknesses (Bukhari 2014).

Despite these challenges, Pakistan has a forest area of about 4.392 million hectares that is eligible for REDD+ projects. It also has around 40 million hectares of rangeland (which constitutes about 45% of the land area of the country) in which the density of tree cover can be increased under REDD+ carbon stock enhancement programmes (Bukhari 2014).

Chapter 7: Regional Analysis

Demography and forest cover

Among the five countries included in this stocktaking study, India is the largest and Bhutan is the smallest, both in terms of geographical area and population. Bhutan has the highest forest coverage whereas Pakistan has the lowest. The population growth rate is the lowest in Myanmar. The per capita forest area in Bhutan, India, Myanmar, Nepal, and Pakistan is 3.29, 0.28, 1.27, 0.16, and 0.06 hectares, respectively (ICIMOD 2009). Table 10 shows the average proportion of forest dependent populations in these countries to be roughly the same.

Table 10: **Population and forest area**

Country	Total area (km²)	Population (Reference year July 2014)		Total forest area (in %) (assessment year)	Dependent population on forests and subsistence agriculture (in %)
		Total population (million)	Growth rate (%)		
Bhutan	38,394	0.73	1.13	70.45 (2011)	69
India	3,287,263	1,236.34	1.25	21.23 (2013)	70
Myanmar	676,578	5.57	1.03	30.73 (2010)	70
Nepal	147,181	30.98	1.82	39.6 (1999)	More than 70
Pakistan	796,095	196.17	1.49	5.01 (2004)	65

Chitwan National Park, Chitwan District, Nepal

Forest types and management regimes

In the five countries studied, forest vegetation is distributed from sub-tropical to sub-alpine regions with deciduous broadleaf and evergreen coniferous forests, and a mixed of both. Different forest tree species, both deciduous and evergreen, have different levels of carbon sequestration. Thus, forest tree species grown in different topographic and altitudinal regions can have different carbon stocks. In addition, three forest management regimes – government, government-community partnership, and private – function in all five countries studied, which can be a basis for developing a cost-benefit sharing mechanism for REDD+ implementation in the future (Table 11).

Table 11: **Forest types and their management regimes**

Country	Forest type	Forest management regime (on the basis of tenure)		
		Government	Government-community partnership	Private
Bhutan	Fir (*Abies densa*) Mixed conifer Blue pine (*Pinus wallichiana*) Chir pine (*Pinus roxburghii*) Broadleaf mixed with conifer Upland hardwood Lowland broadleaf forest Forest scrub	Protected areas Forest management units and working schemes Community forest		
India	Subtropical dry deciduous Tropical moist deciduous Tropical moist deciduous Subtropical thorn Tropical wet evergreen	Reserved forest Protected forest Unclassed forest	Joint forest management	
Myanmar	Dry forest Coastal Tropical evergreen Mixed deciduous Hill and temperate evergreen Indaing	Permanent forest estate Reserved forest Protected public forest Protected areas		
Nepal	Tropical Sub-tropical Temperate Sub-alpine Alpine	Government-managed forest Protected areas	Community forest Leasehold forest Collaborative management forest Religious forest Protected forest Buffer zone forest	Private forest
Pakistan	Littoral and swamp Tropical dry deciduous Tropical thorn Sub-tropical broadleaf evergreen Sub-tropical pine Himalayan moist temperate Himalayan dry temperate Sub-alpine Alpine scrub	State Reserved Protected Un-classed Resumed land		Guzara Forests Communal Forests Section 38 areas Chos Act areas

Drivers of deforestation and forest degradation

Of the five countries studied, the rate of deforestation and forest degradation is highest in Pakistan (-2.1%) and lowest in India (-0.18%). Bhutan has increased its forest cover by 0.33%, which is a positive indicator for REDD+ implementation. However, the assessment periods for calculating the rate of deforestation and forest degradation in the five countries are not the same, and these figures might have changed in the present context. This may have both positive and negative implications for forest carbon inventory as a reference level and financial incentives from carbon trading in these countries in the future.

Major causes of deforestation and forest degradation in the five countries are similar and include: the demand and supply gap for forest products, conversion of forest areas for development activities, illegal logging, and forest encroachment (Table 12). Similarly, population growth and poverty, conflicting institutional mandates, policies and legislations, and weak governance are some of the key underlying causes of deforestation and forest degradation in these five countries. These factors pose challenges for REDD+ implementation in the future.

Table 12: **Drivers of deforestation and forest degradation**

Country	Rate (in %)	Assessment period	Major causes	Underlying causes
Bhutan	+0.33	2000–2005	• Loss of forest to development activities (electric transmission lines, hydropower projects, housing, roads, mining, and quarrying) • Tsamdo (pasture Land) and livestock • Tseri (shifting cultivation) or slash-and-burn agriculture • Forest fire • Fuelwood • Timber • Poaching and illegal logging • Harvesting of NTFPs • Leaf litter collection • Invasive species, pests and diseases	• Policies and legislation • Institutions and institutional linkages • Weak governance
India	-0.18	2011–2013	• Demand and supply gap for forest products, • Forest fire • Overgrazing • Illegal felling • Conversion of forest areas for development activities • Shifting cultivation • High demand for agriculture products	• Population growth • Market forces
Myanmar	-1.1	2004–2010	• Overexploitation of forest timber (legal and illegal) • Overharvesting of wood biomass • Shifting cultivation • Forest fires • Overgrazing • Storms and pests • Expansion of agriculture (subsistence and commercial) • Mining • Hydropower development • Infrastructure (road, pipeline, special economic zones, transmission lines) • Urbanization and resettlement • Development of aquaculture	• Population growth • Increasing demand for food and wood products • Poverty • Poor forest governance and law enforcement • Conflicting institutional mandates • Unclear policy frameworks
Nepal	-1.7	1978–1994	• Illegal logging • Fuelwood consumption • Encroachment • Roads construction	• Increased demand for forestland and forest products • High dependency on forests • Lack of a deliberative and inclusive forest policy process • Poor transparency and corruption • Weak law enforcement • Weak land tenure • Prolonged political transition and instability • Social differentiation and inequality • Population growth • Migration, pressure on resources and related conflicts • Limited access to improved technology
Pakistan	-2.1	2000–2005	• High demand for forest products • Land use change • Natural or manmade hazards	• Population pressure • Lack of land use planning • Settlements and industry • Landslides and erosion • Salinity and water-logging • Droughts and floods • Pests and diseases

Institutions for REDD+

Nepal is ahead of the other four countries in this study in terms of arrangements for REDD+. Nepal submitted its R-PP to the FCPF in 2010, whereas Bhutan, Myanmar, and Pakistan submitted theirs in 2013. India has not yet submitted its R-PP. Nepal has also already institutionalized a robust three-tier governance structure for REDD+ implementation under the Ministry of Forests and Soil Conservation and endorsed policies and strategies in line with REDD+, such as the Climate Change Policy (2011) and Low Carbon Economic Development Strategy (2014) (Table 13).

Table 13: **Institutional set up for REDD+**

Country	R-PP submission date	Institutional setup		New policies related to REDD+
		Government structure for REDD+ readiness implementation	Focal ministry	
Bhutan	8 November 2013	• Cabinet • National Committee on Climate Change • Multi Sectoral Technical Committee on Climate Change • Ministry of Agriculture and Forests • National REDD+ Taskforce • R-PP Executive Board • WMD/REDD+ Office as Secretariat • TWGs: • Strategy options • NFMS & RELs • Safeguards, governance & Biodiversity	Ministry of Agriculture and Forest	• National Forest Policy 2011 (revised) • Final draft of Subsidized Timber Allotment Policy, 2012 (submitted to Cabinet) • Subsidized Timber and Non-wood Forest Produce Allotment Policy 2011 • Framework for Wang River Basin Management • Access and Benefit Sharing Policy • Bio-safety Bill 2013 (submitted to Cabinet) • National Renewable Natural Resources Research Policy of Bhutan2011
India	Yet to Submit	• National REDD+ Cell • State REDD Cells	Ministry of Environment and Forests	Not applicable
Myanmar	July 2013	• REDD+ Cell (national and state levels)	Ministry of Environmental Conservation and Forestry	• Environmental Conservation Law (2012)
Nepal	19 April 2010	• Apex Body • REDD Working Group • REDD Implementation Centre	Ministry of Forests and Soil Conservation	• Climate Change Policy 2011 • Nepal's Low Carbon Economic Development Strategy (2014) • National Land Use Policy (2012) • Three Year Plan (2013–2015) • Nepal National Biodiversity and Action Plan (2014–2020)
Pakistan	31 July 2013	National Steering Committee on REDD+ National Focal Point for REDD+	Climate Change Division	• Establishment of the Ministry of Climate Change in 2012 • National Climate Change Policy 2012 • Guidelines for Wetlands Management 2012 • National Sustainable Development Strategy 2012(Draft) • National Forest Policy 2010 (Draft) • National Rangeland Policy 2010(Draft) • National Environment Policy 2005

Co-benefits of REDD+

Given the five core elements of REDD+, its success will depend on how many co-benefits it generates at the grassroots level during implementation. There can be many activities that support these core elements of REDD+ and that have the potential to generate multiple benefits, which, in many instances, can be more valuable than the revenue from forest carbon The forest carbon price itself will not suffice as an incentive for countries and local communities to participate in REDD+. The value of co-benefits that a project can generate will be key in the decision-making process. A list of possible co-benefits for REDD+ in the five countries studied is given in Table 14.

Table 14: **Co-benefits of REDD+ activities with indicators**

Co-benefits	Indicators	Example of field activity
Livelihood enhancement	1. Employment (forest and biodiversity based) 2. Food and nutrient supplement 3. Water availability and flow regulation 4. Wood energy	Revolving fund, regular income from employment opportunities for women and poor, ecotourism, hydropower, improved cook stoves
Increased biodiversity value	1. Reduced loss of habitat 2. Increased number of species and their population 3. Conservation of endangered species 4. Increased income from bio-prospecting	Increased wildlife, controlling of illegal harvesting, improved NTFP management, wetland river conservation, increased awareness of the local people about the value of forest product and services
Enhanced ecosystem resilience against climate change	Reduced vulnerability from fire, flood, pest infestation, landslides and siltation	Fire line construction and forest protection
Improved governance, institutions and policies	1. Transparent and participatory decision making 2. Equitable access and benefit sharing	Inclusion of women, indigenous and marginalized groups including Dalits in decision making; women leadership
Contribution to Multi-lateral Environment Agreements (MEAs)	Aichi targets met and other indicators of Convention on Biological Diversity, Ramsar, Convention on International Trade in Endangered Species (CITES), United Nations Convention to Combat Desertification (UNCCD) and the post-2015 Sustainable Development Goals	Aligning REDD+ project to support other Multi-lateral Environment Agreement activities at local level

Source: Joshi et al. 2013, p 64

Chitwan National Park, Chitwan District, Nepal
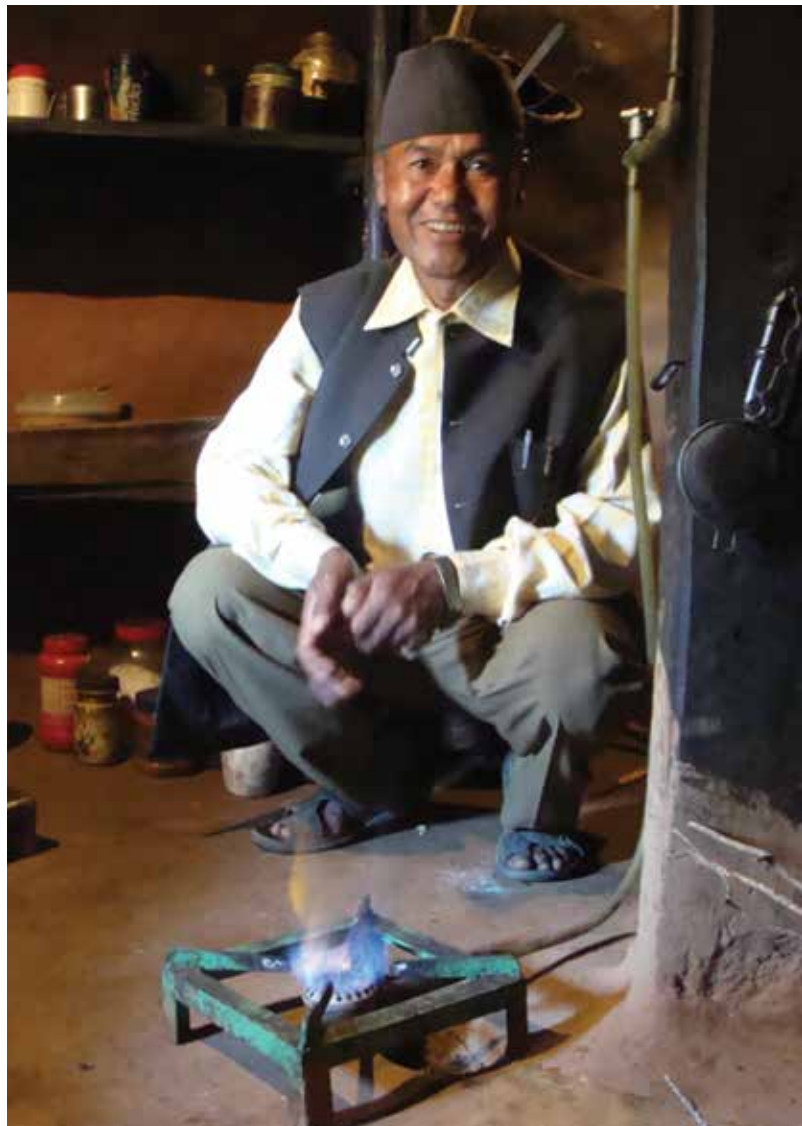
Non-market based approach for the HKH region

In the REDD+ context, the term 'non-market based approach' refers to policy measures and instruments designed to raise adequate, predictable, and long-term resources for enhancing effective mitigation and adaptation actions without internationally transferable units, but 'MRV-ed' so that the outcome can be counted towards the emission reduction target of the contributing country. All activities should be able to meet the standard of delivering real, permanent, additional, and verified mitigation and avoid double counting, according to UNFCCC rules (Government of Nepal 2014).

While complementing market-based approaches, the non-market based approach provides better opportunities for the proportional allocation of resources among the five REDD+ activities (referring to 1/CP 1, paragraph 70 of Nepal's Submission on behalf of the Least Developed Countries to UNFCCC; Government of Nepal 2014). The non-market based approach goes beyond carbon offsets by taking into account the multi-functional attributes of forests. This is designed to create synergies between mitigation and adaptation measures that can complement the respective country's Sustainable Development Goals. A non-market based approach is likely to deliver more equitable outcomes, particularly for the countries in HKH region and could play a significant role in the implementation of REDD+ activities in all countries.

While market-based mechanisms have distinct benefits, experiences indicate that there are numerous risks and limitations for the HKH region. For example, most of the countries in the HKH region have had restricted

A community forest user group member uses a REDD+ supported biogas stove, Dolakha District, Nepal

access to the Clean Development Mechanism market for a multitude of reasons, including, but not limited to, inadequate capacity, lack of quality data, and high upfront and transaction costs. Hence, it would be very difficult to deal with REDD+ as a carbon-centred approach based solely on the quantification of emissions, because most of the REDD+ safeguards and activities ensure multiple benefits (ecological, social, cultural and economic).

Despite intensive efforts for conservation through incentive mechanisms, deforestation remains a persistent problem in the HKH region, as the ecosystem services of forests are still undervalued and considered marginal. Most drivers of deforestation and forest degradation in the region are derived from subsistence-based economic activities. Fuelwood extraction, for example, is a major driver of forest degradation in the region, but there is no formal market for fuelwood in rural areas. Hence, the problem cannot be addressed by market instruments alone. The success achieved so far in biodiversity conservation, watershed restoration, and forest conservation in countries can be attributed to community engagement and is not driven by market forces (Government of Nepal 2014).

Chapter 8: Conclusions and Recommendations

Based on a review of secondary information on Bhutan, India, Myanmar, Nepal, and Pakistan, this study draws the following conclusions and makes six recommendations regarding the development of an REDD+ mechanism for the HKH region.

Status of REDD+ readiness and way forward

The status of REDD+ readiness is not the same in the five HKH countries studied. Among them, Nepal seems to be ahead in the REDD+ readiness process in terms of submitting its R-PP, testing REDD+ pilot projects by NGOs, setting up government institutions, and drafting an REDD+ strategy – although the other four countries are gaining momentum. India on the other hand is at an advanced stage of database management of forest resources and has been carrying out forest inventories in two-year cycles. India has state-of-the-art capacity for conducting MRV in the region, as required by REDD. An up-to-date database of forest resource is essential to receive financial incentives from forest carbon and non-forest carbon trading under the REDD+ mechanism after 2020. In this connection, collaboration and coordination among counties in the HKH region is needed to develop databases of forest

resources for REDD+ initiatives, as well as to raise their collective voice at international forums for the benefit of the people of the HKH region, particularly people living in mountain communities. For this, a regional consortium of HKH countries should be established to lobby at international forums such as the UNFCCC and to reap the benefits from the Green Climate Fund for peace and prosperity in the region.

Recommendation 1: Establish a regional consortium of HKH countries to share best practices for REDD+ readiness; encourage information sharing and collaboration for the development of databases of forest resources for REDD+ specific to HKH region; and jointly lobby at international forums such as the UNFCCC, as well as grasp opportunities such as those provided by the Green Climate Fund.

Forests and their management regimes: Engaging the private sector

While the forest vegetation types of the five HKH countries studied all have different capacities and potentials for forest carbon sequestration, the three forest management regimes are basically the same, namely: government, government-community partnership, and private. Hence, a common cost-benefit sharing mechanism for carbon and non-carbon categories could be developed for the HKH region, considering adequate social safeguards. This would help engage multi-stakeholders, namely, the government, community, and private sector, in the sustainable management of forests and enhance and institutionalize REDD+ governance in all three forest management regimes. From the regional experience, participation from the private sector in the REDD+ discourse is lagging behind.

Recommendation 2: Develop a suitable incentive-based mechanism that will draw private sector investment and engagement in REDD+. So far the private sector has not been an active stakeholder in the REDD+ discourse in the HKH region, but it is key to the successful implementation and sustainability of REDD+.

In addition to the government and communities, it is also important to engage the private sector in REDD+ processes for the sustainable management of forests in the HKH region. For this, the private sector should see the direct benefits coming out of REDD+, so that they can participate and assist the government with its vision for REDD+ implementation. Several pilots with private sector should begin with a pro-poor focus to start with.

Recommendation 3: Develop and pilot (in select countries of the HKH) a new model of community-private forest partnership as part of the REDD+ implementation process for the HKH region.

Challenges of deforestation and forest degradation

Although the rates of deforestation and forest degradation across the HKH region are not the same, their main causes are similar: the demand and supply gap for forest products, conversion of forest areas for development activities, illegal logging, and encroachment on forest lands. The underlying causes are population growth and poverty, conflicting institutional mandates, policies, and legislation, and weak governance. These factors will pose challenges for REDD+ implementation in the future. To combat these challenges, it is necessary to raise public awareness and formulate pro-people policies, strategies, and legal instruments that are compatible with REDD+. For this, concerned stakeholders (government, non-government, civil society, and marginalized social groups such as women, indigenous peoples, tribes, etc.) should have adequate knowledge and understanding of climate change, REDD+, and the benefits that can be derived from forest carbon and non-forest carbon trading under REDD+ mechanisms. Moreover, the capacity of stakeholders must be enhanced in the face of REDD+ and climate change and priority should be given to grassroots actors in capacity development programmes. The meaningful participation of these multi-stakeholders in the process of developing an REDD+ mechanism will be instrumental in making REDD+ happen in future.

Recommendation 4: To overcome the challenges facing REDD+ implementation in the HKH region, it is necessary to raise public awareness of REDD+; formulate pro-people and socially inclusive policies, strategies, and legal instruments for REDD+; and enhance the capacity of stakeholders (government, non-government, civil society, women, indigenous peoples, and tribes etc.), particularly those at the grassroots, to participate in REDD+ and to maximize the benefits accruing to communities from forest carbon and non-forest carbon trading under the REDD+ mechanism.

The importance of REDD+ co-benefits

It is well understood that the success of an REDD+ mechanism depends on how many co-benefits it generates at the grassroots levels during implementation, given that the financial reward may not be a lot. The core elements of REDD+ have the potential to generate multiple benefits, both from forest carbon and non-carbon products. Only focusing on the trading of forest carbon may not be adequate for grassroots actors in the HKH region to participate in the REDD+ mechanism. Thus, co-benefits must be valued and given priority in the process of REDD+, as these are usually more significant than the financial incentives received from the trading of forest carbon.

Recommendation 5: Value and prioritize the co-benefits generated by the REDD+ mechanism at the grassroots level to ensure that the locals receive incentive from carbon and non-carbon benefits.

Complementing a non-market based approach

A REDD+ market-based approach has distinct benefits; however, there are numerous risks and limitations for the HKH region due to the inadequate capacity of human resources, lack of quality data on forest resources, and high upfront and transaction costs. It will not be easy to deal with REDD+ as a carbon-centred approach based solely on the quantification of carbon emissions. Thus, a non-market based approach should be adopted to complement market-based approaches in the development of the REDD+ mechanism. A non-market based approach provides better opportunities for the proportional allocation of resources among the five REDD+ activities, which helps to create synergies between mitigation and adaptation measures for climate change and delivers more equitable outcomes for REDD+ implementation.

Recommendation 6. Adopt a non-market based approach for REDD+ financing in the HKH region, as it complements existing efforts by the countries of the region for biodiversity conservation, improved ecosystem services, and poverty reduction through devolved forestry sector governance and has greater potential to achieve the Sustainable Development Goals in years to come than market-based approaches.

References

Acharya, KP; Dangi, RB; Acharya, M (2012) 'Understanding forest degradation in Nepal.' *Unasylva* 62(238): 31–38

Angelsen, A; Brockhaus, M; Kanninen, M; Sills, E; Sunderlin, WD; Wertz-Kanounnikoff, S (2009) *Realising REDD+: National strategy and policy options*. Bogor, Indonesia: Center for International Forestry Research (CIFOR)

Balla, MK; Tiwari, KR; Kafle, G; Gautam S; Thapa, S; Basnet, B (2014) 'Farmers dependency on forests for nutrients transfer to farmlands in mid-hills and high mountain regions in Nepal (case studies in Hemja, Kaski, Lete and Kunjo, Mustang district).' *International Journal of Biodiversity and Conservation* 6(3): 222–229

Bukhari, SSB (2014) 'Learning on REDD+ in South Asia: The Case of Pakistan.' In Karki, S; Joshi, L; Karky, BS (eds), *Learning on reducing emissions from deforestation and forest degradation. Proceedings of the regional workshop held 24 to 27 July 2012 in Kathmandu* (pp 12–17). Kathmandu, Nepal: ICIMOD

Central Bureau of Statistics (2008) *Environment Statistics of Nepal, 2008*. Kathmandu, Nepal: National Planning Commission Secretariat, Government of Nepal

Community Forestry International (2013) *India – Khasi Hills REDD+ project* [online]. http://www.communityforestryinternational.org/redd-carbon-sales/ (accessed 10 April 2015)

Davidar, P; Sahoo, S; Mammen, PC; Acharya, P; Puyravaud, JP; Arjunan, M; Garrigues, JP; Roessingh, K (2010) 'Assessing the extent and causes of forest degradation in India: Where do we stand?' *Biological Conservation* 143(12): 2937–2944

Department of Forest Research and Survey (1999) *Forest resources of Nepal (1987–1998)*. Kathmandu, Nepal: Ministry of Forests and Soil Conservation and Forest Resource Information System Project, Government of Finland

Department of Forest Research and Survey (2014) *Terai forests of Nepal: 2010–2012*. Kathmandu, Nepal: Department of Forest Research and Survey, Ministry of Forests and Soil Conservation

Devendra, P (2012) 'National forest monitoring for REDD+ in India.' In Mora, B; Herold, M; de Sy, V; Wijaya, A; Verchot, LV; Penman, J (eds), *Capacity Development in National Forest Monitoring: Experiences and progress for REDD+*, pp 19–27. Bogor, Indonesia: Centre for International Forestry Research (CIFOR) and GOFC-GOLD

Department of Forests and Park Services (2011) *Forestry facts, figures & trends*. Thimphu, Bhutan: Ministry of Agriculture and Forests

FAO (1999) *FRA 2000: Forest resources of Bhutan – Country Report*. Rome, Italy: Forestry Department and Food and Agriculture Organization of the United Nations

FAO (2010) *Global forest resources assessment 2010: Country report – Myanmar*. Rome, Italy: Forestry Department and Food and Agriculture Organization of the United Nations

Forest Survey of India (2013) *India State of Forest Report 2013*. New Delhi, India: Ministry of Environment and Forests, Government of India http://fsi.nic.in/cover_2013/sfr_forest_cover.pdf (accessed 12 November 2014)

Ghosh, S (2011) 'REDD+ in India, and India's first REDD+ project: A critical examination.' *Mausam 3* (1): 32–50

Government of Myanmar (2013) *Myanmar REDD+ readiness roadmap*. UN-REDD Programme. Yangon, Myanmar: FAO, UNDP, UNEP, DFID, Government of Myanmar

Government of Nepal (2010) *Nepal's readiness preparation proposal REDD (2010–2013)*. Submitted to FCPF. Kathmandu, Nepal: Ministry of Forests and Soil Conservation, Government of Nepal

Government of Nepal (2014) *Submission by Nepal on behalf of the Least Developed Countries Group with respect to methodological guidance for non-market-based approaches related to the implementation of the activities referred to in decision 1/CP.16, paragraph 70*. Submitted to UNFCCC. Kathmandu, Nepal: Government of Nepal. http://www4.unfccc.int/submissions/Lists/OSPSubmissionUpload/12_15_130452452171450726-Nepal_NMBA.pdf (accessed 23 January 2015)

Government of Pakistan (2013) *Readiness preparation proposal (R-PP)–Pakistan*. Submitted to FCPF. Islamabad, Pakistan:

Ministry of Climate Change, Government of Pakistan

Grierson, AJC; Long, DG (1983) *Flora of Bhutan*. Edinburgh, Scotland: Royal Botanical Garden

ICIMOD (2009) *Potential for carbon finance in the land use sector of the Hindu Kush-Himalayan region*. Kathmandu, Nepal: ICIMOD

ICIMOD, ANSAB, FECOFUN (2010) *Baseline report of forest carbon stocks in Ludikhola, Kayarkhola and Charnawati watersheds of Nepal*. Unpublished report submitted to ICIMOD, Kathmandu, Nepal

ICIMOD, ANSAB, FECOFUN (2011) *A monitoring report on forest carbon stocks changes in Ludikhola, Kayarkhola and Charnawati watersheds of Nepal*. Unpublished report submitted to ICIMOD, Kathmandu, Nepal

ICIMOD, ANSAB, FECOFUN (2012) *A monitoring report on forest carbon stocks changes in Ludikhola, Kayarkhola and Charnawati watersheds of Nepal*. Unpublished report submitted to ICIMOD, Kathmandu, Nepal

ICIMOD, ANSAB, FECOFUN (2013) *A monitoring report on Forest Carbon Stocks Changes in Ludikhola, Kayarkhola and Charnawati Watersheds of Nepal*. Unpublished report submitted to ICIMOD, Kathmandu, Nepal

Jha, BN; Paudel, G (2010) 'REDD monitoring, reporting and verification systems in Nepal: Gaps, issues and challenges.' *Journal of Forest and Livelihood* 9: 1

Joshi, L; Karky, BS; Poudel, KC; Bhattarai, K; Dangi, R; Acharya, K; Uprety, B; Singh, V; Chand, N; Manandhar, U (2013) 'Co-benefits of REDD+ in community managed forests in Nepal.' *Journal of Forest and Livelihood* 11(2): 65–68

Khanal, DR; Poudyal, BH (2013) *REDD+ Safeguards in Nepal: Initiatives and issues.* Discussion Paper Series 013.1. Kathmandu, Nepal: Forest Action Nepal

Lele, N; Joshi, PK (2009) 'Analyzing deforestation rates, spatial forest cover changes and identifying critical areas of forest cover changes in North-East India during 1972–1999.' *Environmental Monitoring and Assessment* 156: 159–170

Land Use Planning Project (1995) *Dzongkhag data sheets for Bhutan*. Thimphu, Bhutan: Land Use Planning Project, Policy and Planning Division, Ministry of Agriculture

Lang, C (2011) *India's first REDD project in the East Khasi Hills: A response from Mark Poffenberger, Community Forestry International* [online], 1 December 2011. REDD Monitor. http://www.redd-monitor.org/2011/12/01/indias-first-redd-project-in-the-east-khasi-hills-a-response-from-mark-poffenberger-community-forestry-international/ (accessed 9 April 2015)

Lyster, R (2011) 'REDD+, transparency, participation and resource rights: The role of law.' *Environmental Science & Policy* 14(2): 118–126

Maraseni, TN; Neupane, PR; Lopez-Casero, F; Cadman, T (2014) 'An assessment of the impacts of the REDD+ pilot project on community forests user groups (CFUGs) and their community forests in Nepal.' *Journal of Environmental Management* 136(0): 37–46

Ministry of Agriculture and Forests (2011) *Land cover atlas of Bhutan 1:250000*. Thimphu, Bhutan: Ministry of Agriculture and Forests

Ministry of Forests and Soil Conservation (2002) *Forest and vegetation types of Nepal*. Kathmandu, Nepal: Department of Forest and Natural Resource Management Sector Assistance Programme (NARMSAP)

Nasir, SM (2012) *Supplement to expression of interest in joining the Forest Carbon Partnership Facility (FCPF)*. Pakistan: FCPF

National Biodiversity Centre (2009) *Biodiversity action plan, 2009*. Thimphu, Bhutan: Ministry of Agriculture, Royal Government of Bhutan

National Statistics Bureau (2012) *Statistical yearbook of Bhutan*. Thimphu, Bhutan: Watershed Management Division, Department of Forests and Park Services, Ministry of Agriculture and Forests

Noord, HV (2010) *Feasibility of REDD+ in Bhutan: A scoping study*. Thimphu, Bhutan: Watershed Management Division, Department of Forests and Park Services, Ministry of Agriculture and Forests; SNV

Ohsawa, M (1987) *Life zone ecology of the Bhutan Himalaya*. Chiba, Japan: Chiba University

Pandey, D (2012) 'National forest monitoring for REDD+ in India.' In Mora, B; Herold, M; de Sy, V; Wijaya, A; Verchot, LV; Penman, J (eds), *Capacity Development in National Forest Monitoring: Experiences and progress for REDD+*. Bogor, Indonesia: Centre for International Forestry Research (CIFOR) and GOFC-GOLD, pp 19–26

Pattanaik, C; Reddy, CS; Reddy, PM (2011) 'Assessment of spatial and temporal dynamics of tropical forest cover: A case study in Malkangiri district of Orissa, India.' *Journal of Geographical Sciences* 21(1): 176–192

Paudel, NS; Khatri, DB; Khanal, DR; Karki, R (2013) *The context of REDD+ in Nepal: Drivers, agents and institutions*. Occasional Paper 81. Bogor, Indonesia: Centre for International Forestry Research (CIFOR)

Poudel, M; Thwaites, R; Race, D; Dahal, GR (2014) 'REDD+ and community forestry: implications for local communities and forest management: A case study from Nepal.' *International Forestry Review* 16(1): 39–54

Planning and Statistics Division, Forest Department (2010) *Status of Permanent Forest Estate in Myanmar*. Planning and Statistics Division, Forest Department, Myanmar

Puyravaud, JP; Davidar, P; Laurance, WF (2010) 'Cryptic destruction of India's native forests.' *Conservation Letters* 3(6): 390–394

Ravindranath, NH; Srivastava, N; Murthy, IK; Malaviya, S; Munsi, M; Sharma, N (2012) 'Deforestation and forest degradation in India: Implications for REDD+.' *Current Science*: 102(8): 1117–1125. http://www.academia.edu/2538205/Deforestation_and_forest_degradation_in_India_implications_for_REDD (accessed 12 November 2014)

REDD Forestry and Climate Change Cell (2011) *Study on REDD plus piloting in Nepal*. Kathmandu, Nepal: Ministry of Forests and Soil Conservation

REDD Forestry and Climate Change Cell (2012) *Study on drivers of deforestation and degradation of forests in high mountain regions of Nepal*. Kathmandu, Nepal: Ministry of Forests and Soil Conservation

REDD Forestry and Climate Change Cell (2013a) *Institutional assessment of relevant actors within and outside the Ministry of Forests and Soil Conservation*. Kathmandu, Nepal: Ministry of Forests and Soil Conservation, Government of Nepal

REDD Forestry and Climate Change Cell (2013b) *Nepal's MRV system management architecture: structure, functions, human resources and capacities*. Kathmandu, Nepal: Nepal, Ministry of Forests and Soil Conservation, Government of Nepal

Robledo, C; Gardi, O; Bukhari, N (2010) *Natural resource management and climate change mitigation, adaptation and REDD+: Part III: Policy approaches and incentives for REDD+*. Pakistan: Intercooperation Pakistan

Roder, W; Dorji, K; Gratzer, G (2003) 'Nutrient flow from the forest: Source of life for traditional Bhutanese agriculture.' *Centralblatt fuer das gesamte Forstwesen* 120: 65–72

Romijn, E; Herold, M; Kooistra, L; Murdiyarso, D; Verchot, L (2012) 'Assessing capacities of non-Annex I countries for national forest monitoring in the context of REDD+.' *Environmental Science & Policy* 19–20(0): 33–48

Roy, R; Silori, CS; Poudyal, BH; Paudel, NS (2014) *Grassroots capacity development for REDD+: Approaches and key lessons from Nepal*, Policy Brief No. 31. Kathmandu, Nepal: ForestAction

Royal Government of Bhutan (2013) *Readiness Preparation Proposal (R-PP) for Country: Bhutan*. Submitted to FCPF. Thimphu, Bhutan: Department of Forests and Park Services, Ministry of Agriculture and Forests, Royal Government of Bhutan

Sahoo, S; Davidar, P (2013) 'Effect of harvesting pressure on plant diversity and vegetation structure of Sal forests of Similipal Tiger Reserve, Odisha.' *Tropical Ecology* 54(1): 97–107

Sarkar, J (2011) 'REDD, REDD+ and India.' *Current Science* 101(3)

Sharma, V; Chaudhry, S (2013) *An overview of Indian forestry sector with REDD Approach*. International Scholarly Research Notices (ISRN) Forestry

Shrestha, S; Karky, BS; Karki, S (2014) 'Case study report: REDD+ pilot project in community forests in three watersheds of Nepal.' *Forests* 2014 (5): 2425–2439

Singh, TP (2013) 'Getting ready with REDD+ strategy for India.' *Current Science* 104 (10): 1274

Sud, R; Sharma, JV; Bansal, AK (2012) *International REDD+ architecture and its relevance for India*. India: Ministry of Environment and Forests, Government of India, the Energy and Resources Institute (TERI) and Norwegian Embassy. http://www.teriin.org/projects/nfa/pdf/Policy_Brief_International_REDD.pdf (accessed 10 September 2014)

The Ministry of Environment and Forests (nd) *National REDD+ policy and strategy*. New Delhi, India: Ministry of Environment and Forests

UNFCCC (2011) *Framework Convention on Climate Change: Report of the Conference of the Parties on its Sixteenth Session, held in Cancun from 29 November to 10 December 2010. Part two: Action taken by the Conference of the Parties at its Sixteenth Session.* Geneva, Switzerland: UNFCCC

United States Central Intelligence Agency (2014) *The World Factbook – Bhutan* [online], updated 1 November 2014. Washington, USA: Brassey's Defence Publishers. https://www.cia.gov/library/publications/the-world-factbook/geos/bt.html (accessed 4 November 2014)

United States Central Intelligence Agency (2014) *The World Factbook – India* [online], updated 1 October 2014. Washington, USA: Brassey's Defence Publishers. https://www.cia.gov/library/publications/the-world-factbook/geos/in.html (accessed 29 October 2014)

United States Central Intelligence Agency (2014) *The World Factbook – Myanmar* [online], updated 1 November 2014. Washington, USA: Brassey's Defence Publishers. https://www.cia.gov/library/publications/the-world-factbook/geos/bm.html (accessed 5 November 2014)

United States Central Intelligence Agency (2014) *The World Factbook – Nepal* [online], updated 1 October 2014. Washington, USA: Brassey's Defence Publishers. https://www.cia.gov/library/publications/the-world-factbook/geos/np.html (accessed 30 October 2014)

United States Central Intelligence Agency (2014) *The World Factbook – Pakistan* [online], updated 1 October 2014. Washington, USA: Brassey's Defence Publishers. https://www.cia.gov/library/publications/the-world-factbook/geos/pk.html (accessed 31 October 2014)

UN-REDD (n.d.) *The UN-REDD programme strategy 2011–2015.* FAO, UNDP, UNEP. http://www.unep.org/forests/Portals/142/docs/UN-REDD%20Programme%20Strategy.pdf (accessed 31 August 2015)

UN-REDD (2014) *Understanding drivers and causes of deforestation and forest degradation in Nepal: Potential policies and measures for REDD+.* Kathmandu, Nepal: Ministry of Forests and Soil Conservation/UN-REDD Programme

USAID (2010) *US REDD+ Programs: Addressing climate change by conserving and restoring the world's forests.* United States: US Department of State, US Agency for International Development, US Department of Treasury, US Department of Agriculture (including US Forest Service), US Environmental Protection Agency, NASA, US Department of the Interior (including US Geological Survey)

Vijge, MJ; Gupta, A (2014) 'Framing REDD+ in India: Carbonizing and centralizing Indian forest governance?' *Environmental Science & Policy* 38: 17–27

Web references

http://unfccc.int/kyoto_protocol/status_of_ratification/items/2613.php (accessed 22 January 2015)

http://unfccc.int/resource/docs/2010/cop16/eng/07a01.pdf (accessed 23 January 2015)

http://www.india.gov.in/india-glance/profile (accessed 15 November 2014)

http://www.un-redd.org/NewsCentre/Newsletterhome/1Feature2/tabid/1588/language/en-US/Default.aspx (accessed 9 October 2014)

http://www.un-redd.org/Newsletter25/7_New_Countries/tabid/78563/Default.aspx (accessed 22 January 2015)

https://www.forestcarbonpartnership.org/redd-country-participants (accessed 22 January 2015)