For the REDD-Forestry and Climate Change Cell

Ministry of Forests and Soil Conservation, Babarmahal, Kathmandu, Nepal

FCPF/REDD/S/QCBS-20:

REDD+ Strategy for Nepal

First draft Strategy report

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Acronyms

ANSAB	Asia Network of Sustainable Agriculture and Bioresources
CBD	Convention on Biodiversity
CBS	Central Bureau of Statistics
CHAL	Chitwan-Annapurna Landscape
CIAA	Commission for the Investigation of Abuse of Authority
CF	Community Forests
CFM	Collaborative Forest Management
CFUG	Community Forest User Group
CIFOR	Centre for International Forest Research
COP	Conference of Parties
DFO	District Forest Office
DNPWC	Department of National Parks and Wildlife Conservation
DoF	Department of Forests
ERI	Environmental Resources Institute
FAO	Food and Agriculture Organization
FCPF	Forest Carbon Partnership Facility
FCTF	Forest Carbon Trust Fund
FECOFUN	Federation of Community Forest Users, Nepal
FRA	Forest Resource Assessment Project
GoN	Government of Nepal
Ha	Hectare
HH	Households
ICIMOD	International Centre for Integrated Mountain Development
INC	Initial National Communication
IUCN	International Union for Conservation of Nature
MAP	Medicinal and Aromatic Plants
MFSC	Ministry of Forests and Soil Conservation

MoHA	Ministry of Health Administration
MRV	Measurements, Reporting and Verification
MPFS	Master Plan for the Forestry Sector
MSFP	Multi Stakeholder Forest Project
NEA	Nepal Electricity Authority
NEFIN	Nepal Federation of Indigenous Nationalities
NGO	Non-Governmental Organization
NLFS	National Labour Field Survey
NPC	National Planning Commission
NR	Nepalese Rupee
NORAD	Norwegian Agency for Development Cooperation
PA	Protected Area
REDD	Reducing Emissions from Deforestation and Forest Degradation
RIC	REDD Implementation Centre (formally REDD Cell)
R-PP	Readiness Preparation Proposal
RRI	Rights and Resources Initiative
SESA	Strategic Environmental and Social Assessment
Tg	Terra gram
TNC	Timber Corporation Nepal
UNCCD	United Nations Conventions to Combat Desertification
UNFCCC	United Nations Framework Convention on Climate Change
UNFF	United Nations Forum on Forests
UNHCR	United High Commission on Refugees
USAID	United States Agency for International Development
USD	United States Dollars
VDC	Village Development Committee
WECS	Water and Energy Commission Secretariat
WWF	World Wildlife Fund

Introduction

i. REDD+: Concept and Evolution

The concept of REDD (Reducing Emissions from Deforestation and forest Degradation) has been developed with the idea of creating an international framework to halt deforestation and forest degradation under the United Nations Framework Convention on Climate Change (UNFCCC). It is a framework through which developing countries will be rewarded financially for emissions reductions achieved through a decrease in the conversion of forests to other land covers (Parker et al, 2009), and reducing emissions from forest degradation.

REDD was first discussed at the 11th Conference of Parties (COP) in Montreal (at that time it stood for Reducing Emissions from Deforestation in Developing Countries). Costa Rica and Papua New Guinea submitted a document ("Reducing Emissions from Deforestation in Developing Countries: Approaches to Stimulate Action") and requested to put the discussion about reducing emissions from deforestation and forest degradation in natural forests as a mitigation measure on the agenda.

The actual development of the REDD mechanism was initiated at the 13th COP in Bali (2007) where the first substantive decisions on REDD were adopted. In response to the decisions on REDD, amongst others, the UN-REDD Programme was created consisting of representatives of FAO, UNDP and UNEP. At the same time the Forest Carbon Partnership Facility (FCPF) was launched by the Worldbank, nine donor governments and TNC.

With formally prioritising conservation, sustainable management for forests and enhancement of forest carbon stocks at the same level of importance as deforestation and forest degradation, in 2008 at the 29th session of the Subsidiary Body for Scientific and Technological Advice (SBSTA) in Poznan, the '+' in REDD+ was first introduced. This shift was adopted in 2009 at the 15th COP in Copenhagen and formalised at COP 16, 2010, in Cancun where it was agreed that the aforementioned five topics are within the scope of REDD+.

Key methodological decisions, such as the decisions on Safeguards, reference levels and the development of national REDD+ strategies were also made at COP 16 and COP 17. At COP 19, 2013, in Warsaw, seven decisions followed related to: finance; implementation; national forest monitoring systems; safeguards; reference (emission) levels; monitoring, reporting and verification (MRV); and addressing the drivers of deforestation and forest degradation. These decisions are jointly known as the "Warsaw Framework on REDD-plus"

The advances that are made during and outside the climate conferences contribute to the development of a coherent and practicable REDD+ framework.

ii. REDD+ in Nepal's Context

Nepal's landscape reflects its topographic, physiographic and cultural diversity which results in a complex mosaic of agriculture and forests (R-PP). The country size is 14.78 million hectares, of which 5.8 million hectares (39.6%) is covered by forest. In the past 20 years, Nepal has had a relatively low rate of deforestation and forest degradation, varying however considerably at sub-national level and across forest management regimes and ecological zones. The political reality of Nepal has led to substantial changes in land use change patterns, with an influx of people in the urban centres over the last decade. However, with increasing political stability this may change again in the decades to come; this is hitherto unknown though.

With a growing population and increasing demand in forest products and land, forests can be expected to be under increasing pressure again. This could affect the livelihoods of a large number of people and Nepal's environmental sustainability.

Participation in the international REDD+ mechanism has potential for Nepal, to generate carbon revenues as well as non-carbon benefits for the country and its people. Preliminary estimates show that REDD+ may bring between $20-86 million per year to Nepal (UN-REDD, 2014). Nepal further envisions that REDD+ implementation will assist in advancing sustainable forest management, the integral design of various sectoral policies that optimise cross-sectoral synergies, and will lead ultimately to an improvement of forest law enforcement and governance at large. A sound REDD+ architecture will also help in achieving Nepal's obligation to contribute to global low carbon emission development pathways and the global sustainable development agenda.

iii. Nepal's Journey towards REDD+

Past and present forest policies, institutional arrangements and forest management strategies have been principally determining forest change trends in Nepal (Gautam, 2004). For instance, the nationalisation of forests in 1957 is commonly believed to be the main underlying cause for the increase in deforestation and forest degradation (Hobley 1985; Shrestha 1996 in Gautam, 2004). As a means to address the high rates of deforestation the strategy emerged to decentralize policies and decision making and, in 1978, the GoN implemented community-based forest management with notable, however variable across-region success.

Participation in REDD+ is considered as the next step in decentralisation of forest management, strengthening of community forestry and resource use, sustainable land use and reversing deforestation and forest degradation.

Nepal is signatory to the UNFCCC (since 1992) and the Kyoto Protocol (since 1997). Soon after the 13th COP, in 2007, in Bali, Nepal became active with REDD+. The Ministry of Forest and Soil Conservation submitted a REDD Readiness Plan Idea Note (R-PIN) in March 2008 and after approval the REDD Cell (REDD Forestry and Climate Change Cell) was established. Currently, the FCPF, through the R-PP, has

been supporting the REDD+ Cell in conducting studies and developing policy initiatives towards REDD+ readiness. Also a number of other development agencies, including the Department of International Development of the United Kingdom, the Swiss Agency for Development and Cooperation, the Finish Government, USAID and the Japan International Cooperation Agency, have been actively supporting the implementation of the R-PP (MFSC, 2010). In parallel, several NGOs and CSOs, active on REDD+ issues are involved in REDD+ pilot and demonstration activities.

Nepal joined the United Nations collaborative initiative on REDD in developing countries (UN-REDD) in 2009. In 2012, the GoN requested targeted support from the UN-REDD Programme on two issues: Management of REDD+ finance at the national level; and, the formulation of strategies to address drivers of deforestation and forest degradation (UN-REDD, 2014). Additionally, in 2014, UN-REDD Targeted Support has been requested to provide Nepal with a comprehensive set of approaches to design and implement a nationally-appropriate REDD+ Strategy. This Strategy report has been developed in consultation with the UN-REDD agencies and the report is written in parallel with the expected output of this Targeted Support. The GoN is now operating under an extension of the Readiness Grant until June 2015.

iv. National REDD+ Strategy Formulation Process

Nepal prepared a Readiness Preparation Proposal (R-PP) which has been approved by the FCPF in October 2010. The MFSC has formed a three tiered REDD+ institutional framework consisting of the high-level, inter-ministerial Apex Body, the multi-stakeholder REDD Working Group and the REDD Cell. The Apex Body and the REDD Working Group (RWG) are multi-stakeholder forums. All three bodies have been working together to prepare the REDD National Strategy and implementation plan. In addition, a Stakeholder Forum was established to engage wide range of stakeholders in the entire REDD process.

In the development of the R-PP, critical issues were identified and brought forward regarding tenure rights, access to traditional forest resources, carbon rights, forest governance, benefit distribution and safeguards, by interest groups such as FECOFUN, NEFIN and the Dalit Alliance for Natural Resources, (CIFOR, 2013). Through cross-institutional sharing and learning these and other issues have been taken into account in the various assessments and REDD+ strategy development.

Nepal is implementing a series of activities as stipulated in the R-PP to prepare itself for a REDD+ mechanism to harness potential benefits of REDD+ implementation in future. Before and since the revised R-PP was generated in 2010, and subsequently been approved, many studies have been performed on the various key subjects such as MRV, RL/REL, SESA and analytical studies on deforestation drivers, the political economy of land use and the value of Nepal's forest. These studies form the basis for an effective design and implementation of a national REDD+ policy framework. This has resulted in a vast amount of valuable reports. The REDD Readiness studies that have been performed over the past years (or are currently being executed) all provide key information necessary for the development of a sound REDD+ implementation Strategy that is suited to the specific national,

regional and local conditions and requirements of Nepal, and therefore, form the foundation for the development of this REDD+ Strategy report. Also research and studies conducted within ongoing projects and pilot studies (e.g. the UN-REDD TS work) and in the area of other, associated non-forestry sectors are incorporated in the process.

In December 2013, Nepal became the third REDD Country to present a Mid-Term Report (MTR) to the FCPF.[1] The MTR reflected progress in several areas (national arrangements and management; assessment of land use and drivers; forest law and governance; and National Forest Monitoring Systems) but recognized that several other areas require additional focus nationally (consultations; REDD+ Strategy options; social and environmental impacts; and information systems for multiple benefits and safeguards).

Comments received on the MTR presentation were positive and commended the GoN for its transparent approach, including its acknowledgement of slow progress initially and discussion of improvements that resulted in expedited progress later. The GoN is considering all feedback including a few notable points:

1. Begin the development of Monitoring & Evaluation for non-carbon benefits;
2. Continue integration of the REDD+ strategy into the national low-carbon economic development strategy;
3. Maintain and enhance the openness and inclusiveness of the process, especially with respect to the development of an ER program;
4. Take advantage of bilateral technical expertise offered from donors; and
5. Focus activities during the grant extension period more strategically on the development of the ER program.

All of these elements have been captured by this REDD+ Strategy document with the **purpose to guide the development of a set of policies and programs for addressing the drivers of deforestation and forest degradation and improving the carbon sink capacity of the forest.** The Strategy Report is developed in line with the principle of the sustainable development objectives of Nepal in general and with the national forestry sector vision - forests for people's prosperity in particular.

v. Report Structure

This report has been split in two parts:

[1] Report: http://www.forestcarbonpartnership.org/nepal or http://MFSC-redd.gov.np/ . Presentation: https://forestcarbonpartnership.org/sites/fcp/files/2013/Nov2013/Nepal%20MTR_edited_Nov%201%202013_MoF.pdf

I. The Strategy document, which is an operational summary of Part II, excluding all explanatory and background information that is highly relevant to understand how we have come to the Strategy; and,

II. Background and explanatory / supporting information underlying the Strategy document as presented in Part I.

The outline for Part II is the result of a multi-stakeholder process dating back to 2012 involving officials from Regional and District based Government Line Agencies, Representatives from the Federation of Community Forestry Users Nepal, other civil society organizations, representatives from different international and national NGOs, and donors and independent REDD+ experts, who all provided input for the development of this framework. Input was collected for the draft strategy framework during District/local level consultations in 15 districts Regional Level Consultation Workshops held in Pokhara, Biratnagar, Hetauda, Dhangadi and Surkhet and a central level stakeholder consultation workshop in Kathmandu; and, was developed in collaboration with and with technical support from the World Wildlife Fund/Hariyo Ban Program, funded by the US Agency for International Development (USAID).

The logical buildup of the report is based on the *Consolidated framework structure for National REDD-plus Strategy of Nepal*, provided by the RIC. Due to some changes and additions, as a result of what is described above, the structure of this report contains some deviations to this provided structure (mainly in numbering of the (sub-)chapters). A relational table was added in Annex 6, to provide an additional overview of how the report and the *Consolidated framework structure for National REDD-plus Strategy of Nepal* relate to each other.

Part I: Strategy Document

Operational Summary of Part II

This Strategy document contained by Part I is the result of many sources of information, some dating back decades, others still being elaborated and finalized as we draft this 1st version of the Strategy document. Consequently, some elements of the Strategy will remain work in progress, and need to be complemented as information becomes available, whilst other sections are pretty firm. Where the former is the case, it is indicated so. Where information is still lacking, suggestions are made in Part II where additional research or fact finding needs to be undertaken.

For all sections more information can be found in Part II and cross-references are provided in Part I in {italics and in brackets} at the end of each section.

I. First Draft REDD+ Strategy Document for Nepal

Besides written sources of information, this 1st draft has been compiled with input from many different stakeholders, experts and representatives, who have been consulted in the course of the elaboration of the Strategy. It has to be acknowledged that REDD+ is a very fast moving area driven by UNFCCC negotiation processes and rapidly enhancing insights and experiences being build up. Moreover, in the Nepalese context some of the complementary studies and reports that will feed into this strategy are not finalized yet. Partly this is due to the high ambition level of the Government of Nepal and the REDD Cell, now called the REDD Implementation Centre (RIC), that has initiated many different studies very shortly following up on each other, and sometimes even overlapping in time. But the other reason is the political momentum currently building up in the international climate change community in the lead up to the political Conference of Parties that will take place in November/December 2015 where a future Climate Regime has to be agreed, including a REDD+ mechanism. So, within this frame of changing circumstances the REDD+ Strategy Document has been compiled.

II. Guiding Features of the REDD+ Strategy *{1}*

The Vision that is guiding this REDD+ strategy reads as follow: to optimize carbon and non-carbon benefits of forest ecosystems for the prosperity of the people of Nepal. *{1.1.1}*

The Mission is to strengthen the integrity and resilience of forest ecosystems, and improve socio-economic and environmental values of forests for communities by improving policy and legal measures, augmenting institutional functioning, and enhancing stakeholders' capacity and capability. *{1.1.2}*

Objectives therefore, include the following: *{1.1.3}*

1. To reduce carbon emission by intensifying sustainable management of forest resources and minimizing the effects of drivers of deforestation and forest degradation across the ecological regions. (S # 1,2,3,4)[2]
2. To ensure fair and equitable distribution of carbon, non-carbon and environmental benefits of forests among right holders. (S # 5)
3. To increase livelihood assets, food security and diversify employment opportunities of forest dependent people, particularly poor and marginalized (S # 6,7,8)
4. To improve and harmonize policy and legal framework to harness carbon and co-benefits; strengthen institutional capability and improve governance of forest agencies. (S # 5,9,10,11,12)

[2] The S# numbers correspond to the Strategic Objectives that are introduced later in the Strategy.

5. To establish and maintain a robust Forest Management Information System with strong monitoring, reporting and verification mechanisms (S # 13)

Guiding Principles are composed of the following values: *{1.1.4}*

1. Synergetic alignment with overall development strategies
2. Building on the successful community-based approaches and practices
3. Enhanced coordination and harmony among different sectors and agencies
4. Utilizing and building on the existing capacity and capabilities
5. Capturing fully the wide range of ecosystem benefits
6. People-centric practices and approaches
7. Equitable benefit sharing and social justice
8. Social, environmental, cultural and economic safeguards
9. Effective and efficient monitoring and information system
10. Transparency and accountability

In terms of **scope**, the categories of forests and protected areas that will be covered by the REDD+ Strategy are those identified by the Forest Act (1993), the National Parks and Wildlife Conservation Act (1973) and the Forest Policy (2000) being: Government Managed Forest; Protection Forest; Community Forest; Collaborative Forest; National Parks; Wildlife Reserves; Hunting Reserves; Conservation Areas; and, Buffer zones. The possibility of including Leasehold forests; Religious forests; Public land forests; and, Private forests will be explored at a later stage. *{1.1.5}*

Initially the accounting will be covering Above and Below Ground Biomass, with the option to include the other **carbon pools** at a later stage. *{1.1.5}*

Accounting will follow a **nested approach** with the national and subnational **scales** complementing each other: Monitoring and Measuring, Reporting and Verification (M&MRV) systems will be designed and set-up by the government, whilst benefit sharing, financing and monitoring activities will mainly be based at the sub-national level. REDD+ activities and regular/periodic carbon monitoring at the subnational level will as much as possible be conducted by the communities that have the delegated authority for the forest management and who have the capacity to do so, whilst receiving technical support from local forest authority. All international (financial) incentives will be received at the national level and the national government will incentivize REDD+ actions at subnational levels with an agreed benefit sharing mechanisms. *{1.1.6}*

The **financing mechanism** that Nepal intends to deploy is likely to be a hybrid of voluntary funding in line with conventional Official Development Assistance (ODA) and other public and private sources; and, a direct market mechanism where REDD+ credits can be traded alongside existing certified (or verified) emissions reductions (CERs). However, a market-linked mechanism that will generate finances through both an auction process or by establishing a dual-market in which REDD credits are linked to, but are not 'fungible' (inter-exchangeable) with existing CERs may also be part of the deployed options. *{1.1.8}*

Targeted Support (TS) as agreed in June 2014 between UN-REDD and the GoN will design the financial mechanism and finance architecture in more detail. Results of that work are expected for July 2015.

A number of instruments and tools need to be designed, determined or put in place before a national REDD+ mechanism can be operationalized. One of them is the determination of a Forest Reference Level (FRL) against which performance can be measured; whilst another is an appropriate **Forest Carbon Trust Fund** (FCTF). *{1.1.8}*

The development and implementation of a robust REDD+ strategy requires designing a suitable legal and institutional framework and removing policy bottlenecks. The Forest Act of 1993, the Forest Regulations of 1995, and the Forestry Sector Policy of 2000 are the major legal and policy foundations of forestry management in Nepal. *{1.2}*

The same Targeted Support (TS) agreed in June 2014 will also include an in-depth review of Policies, Legislation and Regulation. Results of that work are expected for July 2015.

In advance of the FAO review of PLR, a brief review of forest and other related sector **laws, regulations, policies** and adaptation plans, indicate that their coverage is quite comprehensive in the context of REDD+. Issues associated with alternative land use, forest conservation and utilization, irrigation and water resource use, environment and climate change, which are broadly linked to overall sustainable development, are covered one way or another. Strong enforcement in a coordinated and effective way ensuring complementary of all these would have minimized the problem of deforestation and forest degradation to a greater extent. But a number of constraining factors are working adversely or less favorably, largely emanating from strong sector-specific functional approaches followed by the different institutions while formulating their laws or policies with a specific sector-centric focus. This has complicated coordination, and created overlaps and conflicts in a pervasive manner. Subsequent ambiguities, or the lack of clarity on absolute or collective responsibility has made the enforcement and accountability a major problem, both horizontally as well as vertically. *{1.2}*

Nepal is committed to developing and enforcing REDD+ **social and environmental safeguards** during the further refinement and implementation of this strategy. It has been recognized that implementation of REDD+ can pose significant environmental and social risks, as well as provide an opportunity to promote multiple benefits. Potential benefits include the promotion of biodiversity conservation and securing the provision of ecosystem services including water regulation, timber production, erosion control and the supply of non-timber forest products. In addition, REDD+ can result in social benefits such as improvements in governance and livelihoods, and the clarification of land tenure.

The potential risks posed by REDD+ include, amongst others, appropriation of local communities and indigenous peoples' lands (involuntary displacement), other human rights violations, and depletion of biodiversity causing depletion of sources of livelihoods for forest dependent communities. *{1.2.2}*

In principle, Nepal has a well-established **legal system** to implement and include **environmental and social safeguards** in development activities. The policies and regulation related to safeguard in the

context of implementation of REDD+ strategy can be categorized broadly into the following three groups:

1) Policies and regulation related to land acquisition, compensation and resettlement
2) Safeguard of Indigenous Peoples (IPs) and other Vulnerable Communities (VCs)
3) Good governance, social accountability and public consultation *{1.2.2}*

However, just formulation and devolution of policy does not guarantee participation of all. While participation of elite members of civil society has improved governance when compared with the state management of forest, the continuing challenge is to understand how marginalized members of civil society can equally participate in the process. In many situations, democratic norms and values are yet to be institutionalized among service providers. Even when the right to manage forests has been transferred to local communities, they are not able to exercise their rights freely due to poor governance situations. These issues require addressing categorically through policy reform and awareness raising to ensure equal participation of all stakeholders in forest governance irrespective of caste, ethnicity, gender, economic status and remoteness. *{1.2.2}*

The above show that there are some legal provisions in line with **Free, Prior and Informed Consent** (FPIC) requirements as prescribed by REDD+ decisions under the UNFCCC, and applied by financing institutions and donor organizations active in the field of REDD+ (e.g. WB and UN), but effective implementation of these provisions as per FPIC standard is a challenge: a REDD+ project-specific **information disclosure, consultation and participation plan** will need to be developed. The plan should have mechanisms to engage with communities, groups, or individuals affected by REDD+ activities and projects, and with civil society and other stakeholder, through information disclosure, consultation, and informed participation so that they can provide meaningful input into project design and mitigation measures. *{1.2.2}*

III. Historic context and current state of the land-use sector in Nepal

Availability of accurate and reliable information remains a major problem for the analysis of forest cover and land-use change in Nepal. Volumes of literatures do exist discussing forest cover and land-use change, however, the information required for analysis is old, scanty, inconsistent and even frequently contradictory. This makes land use and land cover change analysis complex and outcomes remain coarse and not precise. Analysis is further complicated as the data per physiographic region are erratic, amongst others because some official documents use five physiographic regions while others using three. This issue is important as the forest types, resource pattern and extent of drivers of deforestation and forest degradation varies across these physiographic regions. The Master Plan for the Forestry Sector (MPFS) 1988 is the only comprehensive official document that provides detailed information on

land use and land cover change information by physiographic regions, aside from the currently ongoing Forest Resource Assessment by FAO (FRA) – see also chapter 3 below. *{2.1.1}*

This document also uses five physiographic regions as adopted by the MPFS and discusses land use and land cover changes over the various periods of time to the extent possible. *{2.1.1}*

III.a Forest cover & forest loss

In 30 years between 1964 and 1994, Nepal lost 2.124 million hectare of forests, which were either converted into shrubland or into other land uses (Table 1). During this period, the area of forest has decreased from 45.5% to 29% loosing 16.5%. However, the Forest Resource Assessment by FAO shows an annual loss of 1.39% from 2000 to 2005 and forest area remaining stable during 2005-2010 (FAO, 2010) albeit that variation within and between subnational regions can be quite significant, as shown by some sub-national studies. *{2.1.1}*

Table 1. Forest Cover Status during four different time period rounded off to full numbers

Cover Type	Unit	Years					
		1964 (FSRO)	1978/79 (LRMP)	1985/86 (MPFS)	1994 (NFI)	2000 (FAO)	2005 (FAO)
Forest	Area (000ha)	6402	5617	5518	4268	3900	3636
	Percentage	46	38	37	29	27	25
Shrub	Area (000ha)		690	706	1560	1753	1897
	Percentage		5	5	11	12	13
Total	Area (000ha)	**6402**	**6307**	**6224**	**5828**	**5653**	**5533**
	Percentage	**45.5**	**43**	**42**	**40**	**38**	**38**

Source: MPFS, 1988; DFRS, 1999; FAO, 2005; WECS, 2010

Table 2, below presents the forest cover change in different time series, expressed as hectares lost or gained, in absolute terms as well as relative over time. *{2.1.1}*

Table 2. Forest cover change data in different time series (Area in 000 ha)

Period	Forests			Shrublands			Forest and Shrub together		
	+/- '000' ha	% change	% change /year	+/- '000' ha	% change	% change /year	Total change '000' ha	% change	% change /year
1964-1978/79	-786	-12.28	-0.88	0			-786	-12.28	-0.88
1978/79-1985/86	-98	-1.75	-0.22	+17	+2.46	+0.3	-81	-1.28	-0.09
1985/86-1994	-1250	-22.63	-2.83	+854	+120.96	+15.12	-396	-6.36	-0.80
1978/79-1994	-1348	-24	-1.5	+871	+126.41	+7.9	-477	-7.57	-0.47
1994-2005	-632	-14.81	-1.35	+337	+21.6	+1.96	-295	-5.06	-0.56
1994-2000	-368	-8.6	-1.44	+193	+12.37	+2.06	-175	-3.0	-0.5
2000-2005	-264	6.77	-1.35	+144	+8.2	+1.64	-120	-2.12	0.42

Source: After MPFS, 1988; DFRS, 1999, FAO, 2001, FAO, 2006

III.b Efforts to date to address deforestation and forest degradation

Efforts to date to address deforestation and forest degradation, and to maintain and improve forest land use include: *{2.1.2}*

a) Evolution of the current forest policy and programs
b) Bringing over >33% of national forests under community-based management regimes (community forestry, collaborative forest management, leasehold-, religious- and protected forests)
c) Development and implementation of various policies, legal instruments, plans and programs, including:
   i) The Master Plan for the Forestry Sector (MPFS)
   ii) Community-based forest management
   iii) Community forestry program (over 18,000 Community Forest User Groups (CFUG) involving >2.2 million households and 1.7 million ha of forest)

iv) Collaborative Forest Management (19 collaborative forests cover over 54,000 ha of forest)
v) Pro-poor leasehold Forestry Program operational in over 40 districts covering nearly 43,000 ha of forest in over 7,400 leasehold forest groups
vi) Protection Forests: 8 forests to date covering nearly 134,000 ha of forest, and another 8 in the pipeline covering another 223,000 ha
vii) Religious Forests. Approx. 5000ha
viii) Public land management. Large areas of public barren land can be developed in forests or agro-forestry areas, some by handing over the land to groups of poorer households.
ix) Conservation of ecosystems and genetic resources, including a shift from 'people exclusionary' and 'species focused' towards 'people-centered and community based' approaches
x) Landscape approach for conservation
xi) Community-based conservation including buffer zone areas amounting to 125,475 ha of forests that have been handed over as buffer zone community forests to 393 buffer zone CF Groups
xii) Conservation of Churia Hills: 12.78 % area of 36 Churia districts are Environmental Conservation Areas implementing integrated environment conservation programs
xiii) Soil conservation and watershed management. The Department of Soil Conservation and Watershed Management services 56 priority, in each district having rehabilitated over 10,000 ha of degraded land, 1,600 gullies and 1000 landslides of various scales and implemented many preventive and supportive measures over the last two decades
xiv) Research, survey and inventory work, with for instance a new national forest survey being conducted since 2010
xv) Institutional development. Forestry services at district and local level are provided by 74 District Forest Offices, over 60 District Soil Conservation Offices, 7 District Plant Resources Offices, and 10 National Parks, 3 Wildlife Reserves, 6 Conservation Areas and 1 hunting reserve. The decentralized government at district and VDC level, and an increased interaction with an increasing number of active and vocal civil society, plus the expansion of community based organizations, is demanding governance improvement in terms of efficiency, transparency, rule of law and accountability
xvi) Human Resource Development. Government forestry institutions are employing about 11,000 staff. A reorientation and re-training of staff was triggered by MPFS and training centers at regional level were established. However, despite that, capacity of staff, cultural and attitudinal issues, understaffing are still important constraints for forestry sector institutions
xvii) Monitoring and Evaluation. A Result Based Monitoring and Evaluation (RBME) is emphasized but appropriate human and financial resources are yet to be provided for effective operationalization of this aspiration

III.c Forest Land Tenure; resource, carbon- and customary rights; governance and gender

III.c.1 Land tenure and property rights

Clarity of land tenure and usage rights is vital for REDD+; land tenure and forest property rights are the key issues shaping the social and environmental impacts of REDD+ and related programs. In particular, attention to the usage rights of local forest-dependent communities is of fundamental importance. In addition, unclear land tenure is a significant disincentive for investment in all kinds of forestry projects, as it represents a high risk to the successful project implementation, and the costs of resolving related conflicts are high.

In Nepal the government has the land-ownership of all forests (Section 67 of the Forest Act, 1993) including community forests, leasehold forests and religious forests which are provided to communities or people for the conservation, management and sustainable use of forest and its products. Therefore, in particular CFUGs still face significant threats to their rights to manage and use their forest resources, primarily due to the perpetual lack of secure tenure over the land and forests: CFUGs have access, withdrawal, and management rights over their forests, but they do not have rights over the sale of the total stock of forests and the land on which the biomass stand. Government forestry officials argue that CFUGs only have use rights to forest resources and not to the land (as state is the owner). Furthermore, it is also considered that rights to carbon are vested on ownership and thus, the below-ground carbon in Community Forests would belong to the State. Hence, the government can claim all or part of the revenues from carbon financing, unless those rights are formally transferred to CFUGs or other community groups.

In addition, since Nepali society is highly differentiated and hierarchically structured along the lines of economic status, gender, caste and ethnicity, internal inequities in access to benefits and decision making persist within many CFUGs. Usually, upper-caste men from wealthier families dominate the FUGs and influence decisions that usually end up in unfair benefits flowing to a few elite families. In order to avoid the trend of elite control of the forest users mechanism, the rules need to be revised to prescribe for all User Group Committees to include at least fifty percent representation of dalits, adivasi /janajati peoples and 'below poverty line' community members; and, equally so for trainings, sensitization, workshops and other activities at all levels of meetings, discussions and interaction.

All together it is clear that reform of the laws and policies surrounding forest land tenure is essential to ensure that REDD+ projects that will have both reduce emissions from deforestation and degradation, and positively impact the livelihoods of forest communities by maximizing the flow of REDD+ benefits to these groups. *{2.1.3}*

Not only in the area of land tenure, but also in the area of natural resource rights and associated governance issues and issues of customary rights there is still a long way to go in terms of matching intend with regulation and implementation. *{2.1.4}*

III.c.2 Carbon rights

With respect to carbon rights, there is no single legal reference for clarifying carbon ownership, and thus this remains to be resolved. A key principle however, is that carbon rights should be linked to land and forest tenure rights to minimize complexities and there will be a less direct link between forest management responsibility and the potential benefits from carbon trading. However, given the absence of secure community land tenure, there is no legal precedence for communities to obtain carbon rights. For example, carbon rights are less clear in the context of CFM. CFM in Nepal is based primarily on a forest policy promulgated by the MFSC in 2001. It is not as well defined in terms of governance as CFUG under the Forest Act 1993. This means that issues of ownership and tenure rights for all types of forest management need to be resolved before finalizing and implementing the REDD+ strategy. Thus, carbon rights must be integrated into basic resource and land rights, including customary rights, which in turn must be clarified, strengthened and effectively enforced. In addition, carbon rights must be harmonized with existing laws governing all form of natural resources right. *{2.1.4}*

III.c.3 gender

In terms of gender, in both community and leasehold forestry, women are mandated to hold at least one-third of forest committee positions. However, there is no mechanism gender-equity mechanism for government-managed forests. If the tenure rights consider gender as an integral part and prescribe specific guidelines of mainstreaming, gender equity can be consolidated. For law and policy to influence gender relations in forest tenure, a more nuanced framework is required to deconstruct, reconstruct, and re-conceptualized authority in both the rules and the laws that govern use and benefits, as well as the institutions that make and enforce such rules and laws. *{2.1.4}*

III.d Land-Use Change Drivers

A total of 9 direct drivers of deforestation and forest degradation and 10 underlying causes are identified through a synthesis and analysis of drivers identified by RPP, the drivers identified by different studies during the REDD+ preparation, and verification and prioritization through stakeholder consultations in a number districts, regional and local level workshops. *{2.2}* Table 3 below list the drivers that have been identified, where they occur mainly, and what the impact is in terms of magnitude. *{2.2}*

Table 3. Direct drivers, their underlying causes, nature and area

SN	Drivers	Drivers for	Affecting regions
1.	Forest fire	Degradation	HM (1)*; MH (3); S (1);T (2)
2.	Over grazing/uncontrolled grazing	Degradation	HM (1)*; MH (4); S (1); T (1)

SN	Drivers	Drivers for	Affecting regions
3.	Unsustainable utilization of forest products (unregulated, illegal, poor technology)/Unsustainable harvesting	Degradation	HM (2); MH (3); S (1); T (1)
4.	Weak Forest Management practices (unmanaged/under-managed)	Degradation	HM (1); MH (3); S (1); T (1)
5.	Unplanned infrastructure development (includes manmade disasters)	Deforestation	HM (2); MH (1); S (2) T (4)
6.	Urbanization and resettlement	Deforestation	HM (5); MH (5); S (1) T (1)
7.	Encroachment	Deforestation	HM (5); MH (5); S (1); T (1)
8.	Expansion of invasive species	Degradation	HM (5); MH (4); S (1); T (1)
9.	Mining /excavation (sand, boulders, stones).	Deforestation and degradation	HM (5); MH (3); S (1); T (1)

HM-High Mountain; MH- Middle Hills; S- Churia; T- Tarai and inner Tarai

1- Very high effect; 2- High effect; 3- Medium effect; 4- Low effect; 5-Very low effect

**Effect of forest fire and grazing in terms of exposure, sensitivity and capacity to address*

A total of ten underlying causes are identified as follows: *{2.2}*

1. Disproportionate population distribution and migration pattern
2. Poor policies, implementation and conflicting
3. Poverty and limited livelihood opportunities
4. High dependency in forest products and gap in demand-supply
5. Land use policy and insecure forest tenure
6. Weak governance (enforcement, monitoring, planning, implementation, evaluation, MIS and knowledge management)
7. Weak coordination and cooperation among stakeholders
8. Inadequate human resource development and management
9. Low priority to research and development
10. Poor coping strategy to natural disasters and climate change (including effects of climate change)/lack of integrated climate change disaster management

III.e Gaps in Forest Laws and Policies in the context of REDD+ & Remedial actions

III.e.1 Gaps in Forest Laws and Policies in the context of REDD+

In advance of the more elaborate review of Policies, Legislation and Regulation that is currently being conducted by the FAO under the UN-REDD Targeted Support program, a number of strengths and weaknesses have already been identified but various experts and stakeholders. These include the following: *{2.3.1}*

Carbon and carbon rights: a forest products or a by-product of ecosystem services

- The Forests Act 1993 and Forest Regulation 1995 are framed under the premise that the ownership of all forests land rests with the government. The right to manage and use forest resources has been given to forest users, but the right to carbon is missing.
- Existing policies talk about forest ecosystem services but the subsequent legislations (Acts and Regulations) are silent about the services generated by forest ecosystems such as water and carbon. It is unclear whether they are forest products or simply an ecosystem services.

Arbitrariness in allocation of forestland for other uses and lack of compensation for development in forest area

- In the absence of a sound forest land allocation policy there is arbitrariness in allocation of forests for other uses, such as for the resettlement of Ex-Kamiayas, landless poor, victims of natural disaster, and for infrastructures for public services such as schools, colleges, hospital, hydropower, roads, etc.
- The Forests Act 1993 includes strict provisions regarding the use of forests areas for development activities. However, it has no compensatory measures to discourage development projects in forested areas.

Inconsistencies amongst acts and (by-)laws governing community-based forestry

- The Conservation Areas are governed by different acts and by-laws, as are the institutional and benefit sharing modalities creating inconsistencies in governance, management and benefit sharing mechanism among Conservation areas, Buffer Zone Community Forestry and other forms of community-based forestry outside the Protected Areas System. Consistency needs to be introduced at a broader and conceptual level.
- A number of operational guidelines must be updated/amended (and continue to be updated regularly) to address emerging socio-economic and ecological issues of forest resource management in general and community-based forestry in particular. No such guidelines exist for the operation of conservation areas and the management of public land forestry.
- The Collaborative Forest Management was started in Tarai in 2002 based on a Cabinet decision. The Directives of Collaborative Forest have also been formulated in 2011, however the provisions in forest legislation is not yet made.

Lack of recognition for customary use rights and management practices

- The existing legal framework of the forestry sector does not recognize the customary use rights and management practices of indigenous communities, particularly not in the High Mountain areas.
- One of the major gaps in existing laws relates to sustainable utilization of biological resources and equitable sharing of the benefits accrued from conservation of genetic

resources. The 'access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their utilization' bill is still awaiting parliamentary approval.

- National Parks and Wildlife Conservation related Acts and Regulations have limited reference to the rights of indigenous people, particularly the customary use rights and practices.

Lack of clarity on tenure arrangements and the role of the Private Sector

- Relevancy of the old classification related to national and private ownership of forests amidst diverse forests management regimes and tenure rights lacks clarity.
- Role of private sector including private forestry in NRM development and alternative energy technology is vital but the existing policies and legal framework have poorly defined their roles, nor do they have provisioned any inceptive mechanism.

Conflicts with Sectoral Acts and Regulations

- There are serious conflicts between Forest Acts and Regulations and LSGA 1996 over use of resources
- Rights and authorities conflict with the provisions of the Forest Act, and process, procedures and mitigation measures provisioned by the Environmental Acts and regulations.
- Conflicts exist in jurisdiction and authority between the Ministry of Water Resources, and the Ministry of Forests and Soil Conservation affecting the conservation of forests

Rent seeking practices, pricing problems, lack of clarity on tenure rights and benefit sharing and problem of transparency and accountability

- Tendency of captured practices through manipulation of policy or excessive intervention motivated by rent seeking practices etc.,
- Timber marketing including the pricing and auction system poses a problem especially in the context of forest conservation,
- There are lapses in tenure rights and benefit sharing arrangements under community-managed forestry regimes amidst higher opportunity cost of, among others, forest dependent people's livelihood
- Discretionary power is deployed amidst quasi-judicial system and CFUG-induced conflicts
- Accountability and transparency under different tenure arrangements is weak and consequently causing problems.

III.e.2 Remedial actions

A number of activities at the policy and institutional level have been undertaken to remedy some of the above weaknesses. Apart from major forest related policies like the climate change policy (2011), the land use policy (2012), and the rangeland policy (2012), a new forest development strategy has been drafted recently. In addition, the revised National Biodiversity Strategy Action Plan (2013) and the Forest Encroachment Control Strategy (2012) have been introduced and the Forest Products Sales Authority (2013) has been established: all important steps in the REDD+ readiness preparation process. *{2.3.2}*

Furthermore, some of the elements contained by the R-PP have been expedited including the development of a (sub-national) reference scenario, design of a monitoring system, and the design of a monitoring and evaluation framework. Having said that, the lack of timely donor funding, administrative, procedural and other delays, problem of inter-sectoral ministerial coordination, lack of policy clarity and responsibility dilemma's amongst concerned ministries, and the political transition

affecting timely formulation or revision of rules and regulations, are some of the constraining factors for the timely preparation of some of the above. *{2.3.2}*

III.f Governance issues & Remedial actions

III.f.1 Governance issues

As per the forestry legislations, the Department of Forests and Department of National Parks and Wildlife Conservation has the full authority to control and manage national and protected area forests. The Department of Forest is also responsible to regulate private forests. Local communities, mainly community forest user groups, now manage more than one third of the forest area under their own forest management plans, approved by the concerned District Forest Office (DFO) or protected area warden. Today the majority of the hill forests are under such a community management program. In contrast, most of the Tarai and mountain forests are under government control and management. By rule, all forests should be managed based on the approved management plans. *{2.4.1}*

In order to address deforestations and forest degradations, governance is one of the major challenges. Apart from a mismatch between causes and measures, poor implementation has been a major problem. In many instances, law enforcement has failed to address underlying causes of deforestations and forest degradations adequately. The governance measures have often been limited to the forestry sector despite challenges emanating from other related sectors. For instance, encroachment, road construction and fuel wood collection - having close link with agriculture, infrastructure and energy sectors - is poorly coordinated from an overall governance perspective. Importantly, there is a poor system in place in terms of transparency and accountability at political, bureaucratic and community levels. The experience so far additionally indicates that a drastic reform in the governance of government managed forest especially in the Tarai and mountains will be required in which alternative tenure arrangements may need to be explored. Equally so, in community forestry better alternatives to address emerging governance problems are required. *{2.4.1}*

III.f.2 Remedial actions

Many recent initiatives indicate that with the beginning of REDD+ readiness processes, Nepal is developing or revising many required policies, acts and institutional frameworks which are aimed at improving the governance system to a greater extent. Design of institutional structures and mechanisms have been driven by the aim of ensuring law enforcement, strengthening coordination among concerned agencies and monitoring of activities and implementing anti-corruption measures through the Commission for Investigation of Abuse of Authority (CIAA) and National Vigilance Centre (NVC). There are also attempts to expedite court cases for early decisions. In addition, a new national forestry sector strategy has been developed in which governance is one of the cornerstones. *{2.4.2}*

In parallel, the government has formed a high level committee to address the deepening deforestation and forest degradation problem in Churia area. For facilitating the implementation of forest management activities, sustainable forest management indicators for government managed forests have been endorsed. Similarly, the principle of scientific management of forest has been adopted and its piloting has started in some places. In addition to preparing community forestry guidelines, initiatives are underway to develop SFM indicators for community forests. *{2.4.2}*

Looking towards the future, a number of issues will be critically important to address the governance issues. These include: *{2.4.3}*

a. A result-focused governance system to ensure full compliance to the rules, regulations and policy measures
b. Strengthening of weak state institutions and dismantling of patronage and clientelism-type systems driven by vested political or economic interest
c. A national REDD+ strategy that incentivizes reforms in policy, governance and forest tenure arrangements in an integrated manner
d. An intra- and inter-sectoral integrated approach which requires effective internal, as well as inter-ministerial coordination driven compliance mechanism, for ensuring the implementation of policies and acts
e. Full accountability and transparency at various institutional levels including an effective and time bound, result-oriented review and monitoring system at both the national and local level with independent oversight bodies from the centre to the district level
f. A system that contains reliable and up-to-date information on forest resources, harvesting operations, deforestation and forest degradation, trade of forest products, and overall progress in enforcing law, policies and programs with easy access.

IV. REDD+ strategies and institutional framework structure and design

IV.a Strategies

In order to achieve the vision, mission and five principle objectives mentioned in chapter 1 of this Part I (section 1.1 in Part II), 13 strategies have been identified, each with a number of associated strategic actions.[3] Below the 5 objectives are repeated but now in conjunction with the specific outcomes, followed by the Strategic options associated with that particular objective. For the major strategic actions that need to be undertaken, see section *{2.5.1}* in Part II.

OBJECTIVE 1	To reduce carbon emission by intensifying sustainable management of forest resources and minimizing the effects of drivers of deforestation and forest degradation across the ecological regions. (S #1, 2, 3, and 4)
Outcome 1.1	Forest productivity increased and integrity of ecological system maintained through sustainable forest management and conservation practices.
Outcome 1.2	Policies and measures to develop forestry, to address drivers of deforestation and forest degradation conducive to ecological regions in place, and carbon stock increased.

[3] These strategies are derived, primarily, by reviewing and analyzing the strategic options presented by the R-PP (MFSC, 2010) and the SESA report (REDD Cell/MFSC, 2014), complemented by a number of other studies, consultations carried out in the process of strategy formulation, and best professional judgment and expert opinions from the consortium members.

S1. Enhance carbon stocks, increase supply of forest products, and reduce carbon emissions through sustainable management of forests, land rehabilitation, shrubland management, and by addressing DD in all management regimes.

Sustainable management of forests increases the supply of timber, fuelwood and other forest products so that illegal and overharvesting decreases. Similarly, the management of forests, shrubland and land rehabilitation improves the quality of forests and land thus enhancing carbon stocks. The improvement in management planning of forests and protected areas with provision to address DD reduces carbon emission.

S2. Promote adaptive ecosystem-based approaches and integrated watershed management to conserve biodiversity and enhance the integrity of ecological systems across the landscapes.

REDD+ provides additional incentive to protect carbon stocks and co-benefits. The co-benefits include increase in the value of biodiversity, better ecosystems for climate change adaptation, more resilient ecosystems for climate change adaptation (MFSC, 2014), conservation of watershed and rehabilitation of degraded land.

S3. Promote private and public land forestry with appropriate financial incentives, simplified regulatory provisions and technical support mechanisms to create new forests.

The scope of private forestry particularly in Tarai, inner Tarai and Mid-hills is very high in order to meet the growing demand of wood products. Similarly, forests can be expanded in public land under transmission lines, alongside highways and irrigation canals, on river banks and flood plains. The programs to promote private involvement and investment in the production of forest products not only increase the sustainable supplies but also enhances rural incomes and creates 'green' jobs, which will ultimately reduce the pressure on government forests and help reduce the emissions.

S4. Improve land uses across the physiographic regions (Tarai, Siwalik, Mid-Hills and Mountains)

Land use planning incorporating economic and ecosystem values of forests are key for controlling the conversion of forests into other land uses. The Ministry of Land Reform and Management has lately (2012) prepared a land use policy but the mechanism to translate the policy into plan and practice has not yet developed. Similarly, the absence of forest land use classification in terms of productivity, sensitivity, accessibility, disaster hazard, and climate change vulnerability is resulting in degradation of forests in many parts of the country, particularly in Tarai, Churia and High mountain areas.

OBJECTIVE 2	To ensure fair and equitable distribution of carbon, non-carbon and environmental benefits of forests among right holders. (S # 5)

Outcome 2.1 Policy and institutional arrangement securing tenure and carbon rights and fair benefit sharing in place.

Outcome 2.2 Forest dependent poor and marginalized groups benefited from increased access to forests and decision-making.

S5. Clarify forest tenure, ensure carbon rights and fair benefit sharing among various right holders

Fair benefit sharing among users, particularly of women, Dalit, Indigenous People, and other marginalized groups need to be ensured for the sustainable management of forests. For this, safeguarding the tenure security of forest users and clarifying their carbon rights is the most essential elements.

OBJECTIVE 3 To increase livelihood assets, food security and diversify employment opportunities of forest dependent people, particularly poor and marginalized (S # 6,7,8)

Outcome 3.1 Income and employment of forest dependent poor and marginalized communities improved through enterprise development.

Outcome 3.2 Small and marginal farmers friendly climate smart technologies mainstreamed into forest and farmland management practices and agricultural productivity increased.

Outcome 3.3 Forest-dependent poor and marginalized people friendly alternative energy and wood technology developed and promoted.

S6. Promote forestry and non- forestry enterprise development and enhance livelihood options and employment opportunities for forest dependent poor and marginalized communities.

The pressure for deforestation and forest degradation cannot be reduced unless the needs and issues of forest dependent people are eased with alternative measures. The livelihood needs of poor and marginalized particularly, women, dalit, janajati, indigenous people can be addressed with increased employment opportunities by promoting forestry and non-forestry enterprises.

S7. Increase agricultural productivity for small and marginal farmers by providing sustained supply of inputs for agriculture intensification and contribute to food security.

Effective implementation of REDD+ needs a progressive increase in agricultural productivity and contribute in the food security. However, the increase in yield also has implications for agricultural greenhouse gas emissions. So, it is necessary to identify means to increase productivity without major agricultural emissions and other adverse environmental effects. In this context, responding the needs, interests and rights of small and marginal farmers is particularly important.

S8. Increase access to affordable and efficient technology of alternative wood and energy.

Increase in access to affordable alternative wood and energy reduces the use of wood and thus the pressure in the forest resources. Promotion of alternative wood technologies improves efficiency in wood use. Biogas has tremendous potential to reduce the need for fuelwood particularly in rural areas. Each biogas plant replaces the need for approximately 4.5 tons of fuel wood/year, or roughly 5.1 tons of CO2e/year and additional climate benefits of reduced methane

emissions (MFSC, 2014). Similarly, efficiency improvements of cooking stoves and improved kilns have benefits of addressing DD and additional social and environmental benefits.

OBJECTIVE 4	To improve and harmonize policy and legal framework to harness carbon and co-benefits; strengthen institutional capability and improve governance of forest agencies. (S # 5,9,10,11,12)

Outcome 4.1 Sectoral policies and legal frameworks harmonized and collective efforts attained for climate change mitigation and adaptation.

Outcome 4.2 Service delivery system and governance improved through institutional reform and capacity enhancement of concerned stakeholders.

Outcome 4.3 Climate smart infrastructure planning, construction and maintenance tools and techniques with appropriate safeguard measures in place and direct/indirect impacts on forests minimized.

S9. Develop synergy among various sectors, sectoral policies and legal frameworks for a shared understanding and collective efforts for climate change mitigation and adaptation.

REDD+ strategy has implications for other sectoral policies and strategies and it is also affected by the strategies and policies of many other sectors. So, harmonization among various sector is critically important for synergetic efforts and smooth implementation of strategic actions. Appropriate mechanisms need to be developed to address cross-sectoral conflicts at central, regional and district levels.

S10. Strengthen institutional performance and service delivery system through institutional reform, capability enhancement, and good governance practices.

Forestry sector administration can be characterized by over administration largely governed by the public sector administration of GoN. In the past two decades many efforts were made to reform the forest administration (for example in 1989, 1993, 2000). After 1990's people's movement and further after 2006 second people's movement, Nepal's institutional landscape has significantly changed with active and vocal civil society, expansion of community based organizations and their capacity, increased federations, and greater public awareness about the need of institutional inclusion, equity and good governance. However, the performance and capability of forestry sector organizations have not adequately improved to respond in these changed landscapes.

S11. Enhance technical, managerial and leadership capacity; groom and support champions of change and improve functional collaboration and cooperation among all stakeholders.

Capacity of human resources was well recognized by the MPFS in 1989 and thus took one of bold strategies of training and re-orienting of entire staff of MFSC, which has made a significant effect in enhancing community engagement in forest management. Similarly, the emergence of active and capable civil society, community organizations, federations and climate change issues such as

REDD+ has necessitated forestry staff further capable, competitive, and productive. For an effective implementation of REDD+ technical, managerial and leadership capacity of forestry staff and all stakeholders need to be strengthened.

S12. Promote forest and climate-friendly infrastructure planning, construction and maintenance - ensuring that location and applied technologies minimize both direct and indirect impacts on forest.

There is a tendency of focusing on the forest land for infrastructure development across the country. This makes not only the loss of forest land but also the increased pressure for the remaining forest due to increase in forest product demand. In order to reduce the direct and indirect impact infrastructure development in forests an effective coordination between forestry sector and other development sector is needed at different levels during planning, implementation, monitoring and evaluation.

OBJECTIVE 5	To establish and maintain a robust Forest Management Information System with strong monitoring, reporting and verification mechanisms (S # 13)

Outcome 5.1 A national credible measurement, monitoring, reporting and verification system established with well functional Forest Management Information and Knowledge Management System.

S13. Establish and maintain forest information, monitoring, reporting and verification mechanism with well-equipped Forest Management Information Systems.

In one hand the forestry sector is often undervalued and under-represented in policy-making processes, in other hand a cost effective, robust, and transparent national monitoring and MRV system that provides credible measurement, reporting and verification are the most important elements to accrue benefits from REDD+ initiatives. The lack of clear data and data analysis has remained a serious challenge in forestry sector. So, a National Forest Information Management System (NAFIMS) and a national MRV system need to be established in order to carry out the major functions of monitoring, measurement, evaluation and reporting effectively.

The strength and weaknesses or risks of all 13 strategic options are provided in *{2.5.2}* in Part II.

IV.b Potential Social and Environmental Impacts of the Strategic Options *{2.9}*

Table 4. Positive and negative, social and environmental, potential impacts

Strategy#1: Enhancing carbon stocks and reducing carbon emission	
Social impacts	
Positive	**Negative**
▪ Enhanced quality of life through multiple benefits	▪ Possibility of involuntary resettlement and eviction from

▪ Increased use of indigenous knowledge & ownership ▪ Increased supply of, access to, and value of forest products ▪ Reduced workload/drudgery in general and women in particular ▪ Enhanced capability of local communities	unregistered land ▪ Liability risk if something goes wrong such as fire, storm, drought or other climate related or human related events and community might end up with more costs than benefits ▪ Risks of exposing local communities and indigenous peoples to international commodity markets under the influence of market-based mechanisms and threat to traditional biodiversity-related knowledge and customary knowledge of forest management.
Environmental impacts	
▪ Decreased carbon emissions / increased carbon sequestration/maintained carbon stocks ▪ Reduced deforestation and forest degradation and improved forest condition. ▪ Reduced effects of grazing and reduced lopping of fodder trees ▪ Reduced forest fire damage and reduced GHG emission	▪ Possibility of increasing mono-culture and associated environmental risk ▪ Control of grazing might result negative impacts on existing forest ecosystem where grazing have/had a positive role in maintaining their integrity. ▪ Reduced beneficial effect of fire such as improvement in soil and management of grassland ▪ Habitat and biodiversity loss due to forest management practices
Strategy #2: Conserving biodiversity enhancing the integrity of ecological systems	
Social impacts	
▪ Enhanced livelihood through improved biodiversity and environment services ▪ Increased environmental & social awareness ▪ Stakeholder engagement and participation leading to strengthening public institutions, transparency and promoting democratic processes	▪ Possible conflict, economic loss and destruction of traditional land tenure systems leading to eviction and loss or reduction of farm land/property ▪ Loss of traditional rights of access to and benefits from forest resources particularly forest dependent people ▪ Further marginalization and loss of livelihoods, income, economic opportunities to the poor and marginalized groups if participatory models not effective and elites capture the access and benefits
Environmental impacts	
▪ Improved ecosystem services ▪ Improved conservation of biodiversity & fragile ecosystems ▪ Enhanced biodiversity ▪ Removal of alien/invasive species ▪ Improved soil fertility / productivity / water retention ▪ Reduced land degradation / restored degraded lands ▪ Reduced soil erosion, landslides, flooding ▪ Maintenance of watersheds / aquifers ▪ Enhanced scenic value / sense of place	▪ Risk of focusing in the conservation of few particular species with adverse effect to other species
Strategy # 3: Promoting private and public land forestry	
Social impacts	

▪ Create alternative livelihood opportunities ▪ Removal of threats to livelihoods from forest degradation and secure access to forest resources ▪ Increased supplies of forest products, creating the potential to develop community-based cooperative enterprises ▪ Increased flow of forest products could lead to entrepreneurial development and generate revenue for the state	▪ Reduced food production due to expansion of private forestry in agricultural lands ▪ Risks of eviction for forest dependent marginalized communities including IPs, Dalits and Women ▪ Loss of grasslands, abandoned lands, riverbanks that can be of significant importance to especially mobile Indigenous Peoples ▪ Expansion of private forestry may lead to land grabbing resulting in the demolition of traditional spiritual and holy places, and temples in and around forest areas.
Environmental impacts	
▪ Promotion of appropriate agro-forestry/forestry in marginal, abandoned and drought prone lands ▪ Reduced deforestation / illegal logging ▪ Increased supply of forest products ▪ Increased tree planting ▪ Increased energy sources ▪ Enhanced scenic value / sense of place ▪ Improved soil fertility / productivity / water retention	▪ Risk of conversion of natural forest to monoculture
Strategy # 4: Improving land uses	
Social impacts	
▪ Employment generation through economic and market-based incentives packages to promote optimal land use	▪ Restriction of access to forest resources particularly the poor and marginalized forest dependent people
Environmental impacts	
▪ Improved soil fertility / productivity / water retention ▪ Reduced land degradation / restored degraded lands ▪ Reduced soil erosion, landslides, flooding ▪ Maintenance of watersheds / aquifers ▪ Enhanced scenic value / sense of place	▪ No particular adverse environmental impacts
Strategy # 5: Clarifying forest tenure and carbon rights and sharing fair benefits	
Social impacts	
▪ Improved rights and access to land and forests ▪ Improved in benefit-sharing mechanism ▪ Increased participation and ownership	▪ Risk of unequal distribution of benefits and escalation of social conflict ▪ No or less benefit due to unclear land and resource use right ▪ Exclusion and harm to the local communities, IPs, women, and vulnerable groups ▪ Perverse incentives payment mechanism of a REDD+ initiatives may reward wealthier 'deforestation agents'
Environmental impacts	

▪ Reduced deforestation / illegal logging ▪ Increased supply of forest products	▪ Forest loss/degradation from improved access to forest
Strategy # 6: Promoting enterprise, livelihoods and employment opportunities to forest dependent poor and marginalized	
Social impacts	
▪ Enhanced livelihoods and/or creation of employment opportunities ▪ Promotion of community-based enterprise development with value addition to locally available biological resources, ▪ Alternative income opportunities for the forest-dependent poor and marginalized people ▪ Improved market access / surplus products for markets ▪ Increased supply of, access to forest products	▪ Stakeholder conflicts, including between participants and non-participants ▪ Poor and marginalized groups can be un-informed and thus may not get access to new employment opportunities. ▪ Women and marginalized losing free access to NTFPs due to elite capture of markets
Environmental impacts	
▪ Reduced deforestation / illegal logging ▪ Reduced grazing pressure ▪ Reduced fire incidence and fire damage	▪ Forest loss/degradation from improved access to forest ▪ Loss of ecosystem services
Strategy # 7: Increasing agricultural productivity for small and marginal farmers	
Social impacts	
▪ Improved food security and poverty reduction through enhance agricultural productivity and sustainability ▪ Increased supply and production of fodder and forage ▪ Reduced forest encroachment through more equitable access to productive land, and by increasing agricultural productivity	▪ Dependency on external inputs (fertilizer, seed, pesticides etc.) resulting in further exclusion and marginalization ▪ Poor and the marginalized groups with small land holding not getting much benefits ▪ Landless not getting any benefit
Environmental impacts	
▪ Improved soil fertility / productivity / water retention ▪ Reduced land degradation / restored degraded lands ▪ Enhanced scenic value / sense of place	▪ Forest loss and degradation from agricultural intensification ▪ Chemical pollution from agricultural intensification ▪ Soil erosion due to agricultural intensification
Strategy # 8: Increasing access to affordable and efficient alternative wood and energy	
Social impacts	
▪ Positive health impacts due to reduced workloads and drudgery for local people in general and women in particular and saving their time for other productive purposes. ▪ Improved access to reliable and sustainable sources of energy reducing dependency on forest	▪ Women, poor and the marginalized groups may not afford fuel wood-efficient, alternative or renewable energy technologies ▪ Poor and marginalized people may not be able to access

Environmental impacts	
▪ Decreased carbon emissions / increased carbon sequestration/maintain carbon stocks ▪ Increased energy sources ▪ Reduced pressure in forests	▪ Forest loss/degradation from improved access to forest ▪ Environmental pollution due to increased solid waste
Strategy # 9: Developing synergy among various sectors, sectoral policies and legal framework	
Social impacts	
▪ Improved inter sectoral coordination and cooperation for forest development ▪ Increased access to forest products and level of ownership of the stakeholders	▪ No-decisions due to continuation of inter-sectoral conflict
Environmental impacts	
▪ Collective efforts leading to address deforestation and forest degradation ▪ Better management of forests and biodiversity	▪ Further deterioration if collective understanding is not developed
Strategy # 10: Strengthening institutional performance and service delivery	
Social impacts	
▪ Increased community participation in decision making ▪ Improved Transparency and Governance ▪ Promotion of gender equality and social inclusion with Free, Prior, Informed, Consent (FPIC) ▪ Empowerment of forest dependent communities and recognition of their traditional usufruct rights	▪ Inadequate and superficial consultation can further exaggerate social exclusion ▪ Politicization of community decisions resulting in elite capture
Environmental impacts	
▪ Indirect environmental benefits through improved performance and service delivery	▪ No particular adverse environmental impacts
Strategy # 11: Enhancing capacity, capability and improving collaboration and cooperation	
Social impacts	
▪ Increased stakeholder engagement and participation promoting transparency and governance ▪ Enhanced collaboration and cooperation among the stakeholders for uninterrupted use rights and equitable benefit sharing in communities ▪ Reduced forestry-related illegal activities thus reducing leakage. ▪ Increased employment and income generation opportunities within the country for local communities.	▪ Token participation of women, *Dalits*, IPs and other marginalized groups if not sensitive to existing gender discrimination and social exclusion.
Environmental impacts	
▪ Increased capacity to manage forests and	▪ No particular adverse environmental impacts

biodiversity ▪ Improved skills and knowledge on environmental aspects	
Strategy # 12: Promoting forest and climate-friendly infrastructure planning, construction and maintenance	
Social impacts	
▪ Increased participation / ownership, employment opportunities and better access to market ▪ Local ownership and sustainability of development projects. ▪ Increased environmental & social awareness	▪ Loss of access to forest and sources of livelihood if IEE and EIA recommendation not strictly implemented. ▪ Possibility of further marginalization of landless, women, poor and marginalized people
Environmental impacts	
▪ Reduced environmental risks/ hazards / disasters ▪ Enhanced scenic value / sense of place ▪ Reduced pressure on forests	▪ Decline of biodiversity in compensatory plantation ▪ Habitat fragmentation by infrastructure development ▪ Loss of ecosystem services
Strategy # 13: Establishing and maintaining forest information, monitoring, reporting and verification mechanism	
Social impacts	
▪ Increased easy access to information on forests, plan, plan programs including safeguard measures ▪ Increased public engagement in forestry plan, policy and programs ▪ Improved involvement of communities and stakeholders in SIS, and MRV	▪ Manipulation in reporting for higher incentive leading to false information ▪ Extra-burden to few members of communities increasing their work load
Environmental impacts	
▪ Increased capacity of local people to manage local environment by increasing levels of awareness and knowledge ▪ Improvement in land use and management of forests and biodiversity conservation through improved information	▪ Manipulated or false information can lead to further deforestation and forest degradation. ▪ Miss-interpretation of data and information can lead to wrong land and management practices

IV.c REDD+ Implementation framework

The institutional structure for the implementation of REDD+ strategies and programs will be based on existing government institution using already approved institution where possible. The key elements of these structures will be covering policy, a coordination and steering entity, a MRV system entity and a benefit sharing mechanism entity; all operational from center to sub-national and district levels for the '3Is': *incentives*, *information* and *institutions.*[4] *Incentives* for the performance-based payments and

[4] Institutions are conventions, norms and/or legal rules that form the actors and regulate the relationships

changes in policies; reliable *information* regarding changes in forest carbon stocks to qualify for international funds; and, effective *institutions* to manage information and incentives. *{2.6.1}*

The responsibilities of the proposed REDD+ institutions will be to: *{2.6.1}*

1) set policy direction, coordinate and steer/manage REDD+ programs
2) manage the flow of information among different entities and stakeholders including information on changes in forest carbon stocks
3) manage the flow of incentives to carbon rights holders

For the effective, efficient and transparent functioning of the REDD+ institutions, the following enabling conditions have been identified: *{2.6.1}*

- Using the existing forest institutional structures and arrangements as far as possible.
- Involving multi-stakeholders at different level so that they can effectively participate in, contribute to and benefit from program activities.
- Enhancing capacity and ensuring equitable representation of local forest user groups, civil society groups, relevant government departments, forest dependent people, indigenous people, local communities, women, and *Dalits* at appropriate levels.
- Ensuring the REDD+ information on measurement and reporting is readily available at all levels and to all actors, and relevant data is generated through periodic monitoring of forests, through a tested and institutionalized internal verification system by MRV implementing agency.
- Ensuring that local stakeholders and forest managers in all forest management regimes (CF, CoFM, government managed forests, protection forests, and PAs) participate and engage in field based monitoring.
- Ensuring the REDD relevant data is generated through periodic monitoring of forests, through a tested and institutionalized internal verification system by the MRV implementing agency (the DFRS).

Based on the above emphasis, existing practices of REDD+ preparation, various consultancies /studies and consultations with various stakeholders, the REDD+ strategy proposes the institutional structure as per Figure 1 and Figure 2. It comprises a three-tiered structure of national level, regional level and district/local level. The structure and function of the institutions will be reviewed and updated at a periodic basis during the implementation of the strategy. *{2.6.1}*

between them (Scott 1995; Vatn 2005).

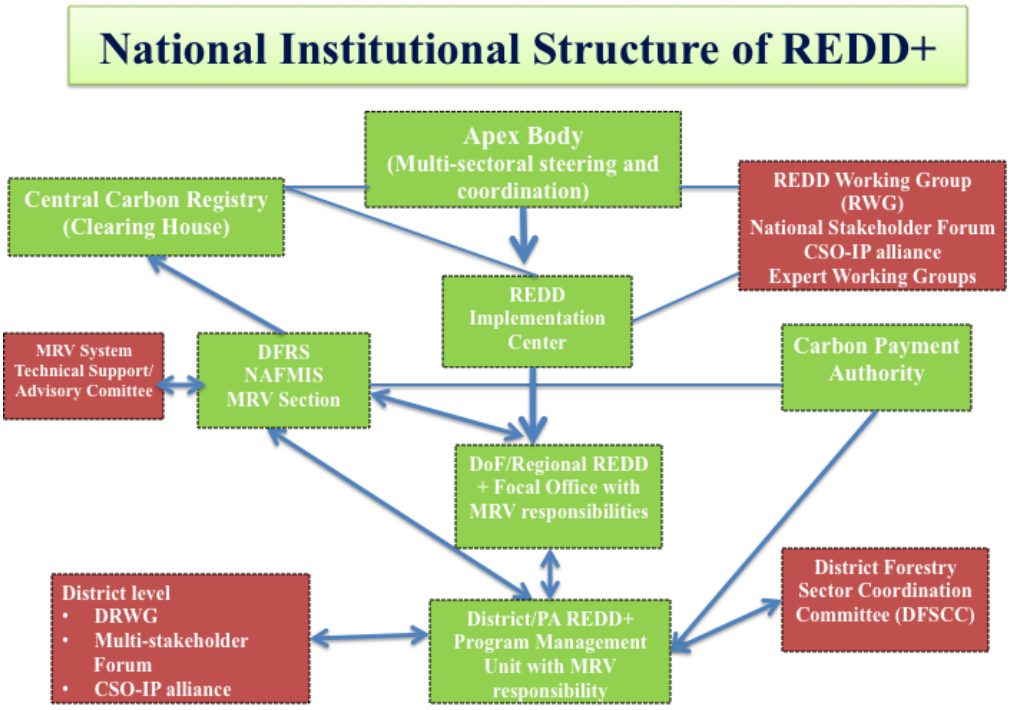

Figure 1. National REDD+ Institutional structure {2.6.1}

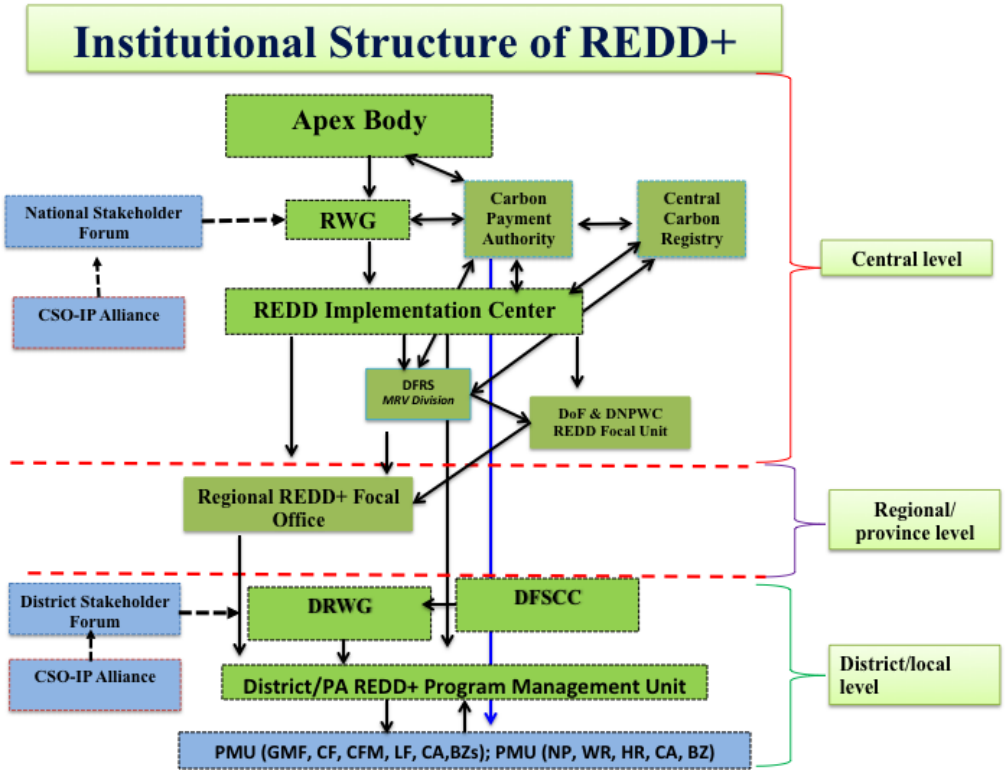

Figure 2. REDD+ Institutional Structure; from national to local level *{2.6.1}*

IV.c.1 The national level *{2.6.1}*

The REDD+ **Apex body** for an inter-ministerial high level policy steering and coordination entity chaired by the Minister of the Ministry of Forests and Soil Conservation is already functional during REDD+ preparation. Its 49 members represent Ministries, the private sector, civil society and government organisations.

The **REDD Working Group** (RWG) is formed from within REDD+ Multi-stakeholder forum chaired by the Secretary of MFSC, has 12 members (9 government and 3 non-government sectors) and will be extended with 3 members from non-government agencies and academia.

The **REDD+ Implementation Center** (RIC, MFSC, headed by Joint Secretary level staff of the ministry) will provide national leadership on REDD+ with responsibility for policy and program development, monitoring, reporting and verification, coordination among different stakeholders and agencies, disseminating information, extension and capacity-building, and ensuring benefit sharing to right holders. The RIC has four sections: Climate Management Section, Remote Sensing and Land Information System Section, Budget and program section, and Admin-finance section. The RIC will need to have a unit with the function of Environmental and Social Assessment and Monitoring.

The **REDD+ Multi-Stakeholder Forum** will function as the principal outreach and communication platform. The forum includes representatives from the private sector, civil society, media, government organizations, community based organizations, local and international NGOs, donors, academia, research organizations and other stakeholders interested in REDD+.

REDD+ CSOs & IPOs Alliance is meant to discuss and develop a common understanding on REDD+ on behalf of Civil Society Organizations and Indigenous Peoples Organizations.

A **Central Clearinghouse or Carbon Registry** will be a repository of REDD+ related information, allow for enforcement of standards and engage in carbon transaction by maintaining broad-based participation of stakeholders in the management of the registry. The central carbon registry will be an independent body in parallel with the Apex body represented by multi-sector/multi-level stakeholders with a separate secretariat to maintain independence.

A **Carbon Payment Authority** is one of the important elements of the REDD+ institutional architecture for the payment of incentives to beneficiaries and will be linked with the MRV section and central carbon registry responsible for tracking carbon benefit transactions according to the volume, location and type of emission reductions (REDD Cell, 2014, institutional assessment for MRV, WP# 3).

DFRS-NAFMIS (MRV Division): the Department of Forest Research and Survey will be the national MRV implementing agency.

A **REDD+ Focal Unit** will be establish at the Department of Forest and Department of National Parks and Wildlife Conservation, which will liaise with the RIC, Regional REDD+ Focal Office and with DRPMU.

A **MRV System Technical Support/Advisory Committee** will be formed to support for research, technology and capacity development and institutional strengthening of M and MRV.

During the REDD+ preparation phase several **Expert Working Groups** were formed to provide technical backstopping to the RWG such as expert working groups for REL/MRV, SESA/ESMF, and National REDD Strategy. Formation of such group will be continued as per the need.

IV.c.2 The regional level *{2.6.1}*

At each Regional Directorate Office (RDO) a Regional REDD+ Focal Office (RRFO) will be created with another unit of Regional REDD+ MRV Unit (RRMU) for the function of MRV.

IV.c.3 The district level *{2.6.1}*

At the district level four distinct institutions are foreseen:

1. **District Forestry Sector Coordination Committee (DFSCC):** based on a MFSC guideline – a multi-stakeholder committee – to monitor the implementation of REDD+ at district level and give policy and strategic direction.
2. **District REDD Working Group (DRWG):** a 15-member multi-stakeholder working group that will assist in the implementation of REDD+ programs in the district, monitor program activities, and advocate and lobby to support emission reduction programs.
3. **REDD+ Multi-stakeholder Forum and REDD+ CSO and IPO Alliance** functioning as the principal outreach and communication platform; advocate for implementing justifiable REDD+ program; and support to empower and build capacity of CSOs and IPOs in the district.
4. **District/ Protected Area REDD+ Program Management Unit (DRPMU)** established at the DFO and Protected Areas where appropriate, which will be the lead institution to implement REDD+ activities in the district/PAs. It will also convene a DRWG meeting every two months; have a MRV section; and an Environment and Social Section (ESC) to ascertain that the REDD+ Safeguards are taken into consideration during REDD+ implementation.

IV.d Institutional Framework for Monitoring and MRV System *{2.6.1.2}*

A three-tiered MRV structural framework is proposed. At the central level, the Monitoring and MRV function will be included in the current survey division of the DFRS. At sub-national level, a REDD+ MRV unit will be established and the MRV section will be established at DFO/PA level. The central MRV section supervises and provides all technical/technological support, builds capacities and logistic support to sub-national MRV divisions. Similarly, sub-national MRV sections provide the technical oversight, guidance and capacity support to the DFOs/PAs and district/local MRV offices.

At **the national level** the Survey Division of DFRS will be reformed to 'Forest Survey and NAFMIS & MRV System Management Division' (this will be referred to as the MRV Division) to ensure effective, efficient and transparent governance of measurement, monitoring and management of data under the MRV system. An institutional structure for NAFMIS is yet to be worked out. The proposed position of the DFRS/MAFIMS/MRV division is illustrated by Figure 3 below.

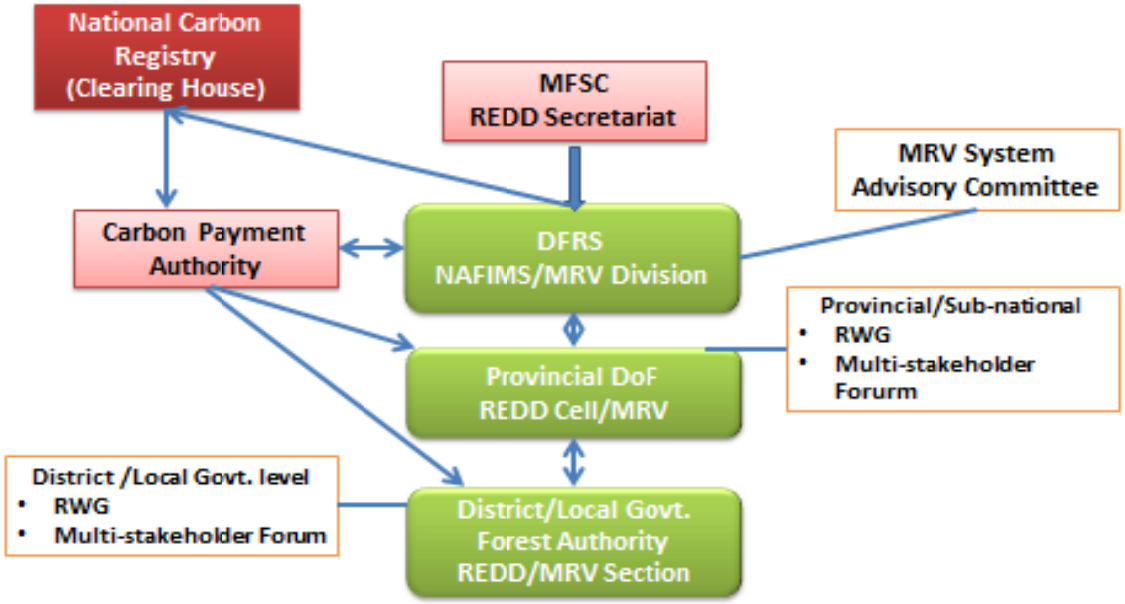

Figure 3. Proposed position of DFRS/NAFIMS/MRV Division

Within the MRV Division there will be four interconnected units: a Database/IT/Metadata Unit; a Remote Sensing/GIS Unit; a Forestry Inventory Unit; and, a Reporting Unit.

At the **sub-national level** a Regional REDD+ MRV Unit (RRMU) will be established under Regional REDD+ Focal Office (RRFO) at the regional forest office, which will coordinate with and guide the district /local level forestry institutions and also supervise and monitor their MRV related activities.

At the **district/local level** a District/PA MRV section (DMRVS) needs to be established under the District/PA REDD+ Program Management Unit of DFO with computer and internet-based database management arrangements. Forest carbon measurement data from all CBFM units and other FMUs participating in REDD+ will have to be validated by the DFO/PA authority, refined and entered in the database maintained at the district/PA level.

IV.e Institutional Structure for Implementing the Safeguards *{2.6.1.3}*

The implementation of the various safeguard measures - such as REDD+ project specific Environment Management Plan (EMPs,) and Social Action Plans (SAPs) that includes resettlement and rehabilitation plans (R&RP), IPs and vulnerable community development plans (IP&VCDP), and gender development plans (GDPs) - will need to be harmonized as an integrated part of the overall REDD + implementation arrangements. The safeguard implementation arrangements consist of institutional structures and responsibilities to minimize and mitigate social and environmental risks related to REDD+ strategy implementation.

At **central level**, an Environmental and Social Assessment and Monitoring Unit (ESAMU) will be established within the REDD+ Implementation Center (RIC), which will serve as the coordinating and implementing agency for REDD+ safeguards. The ESAMU will be responsible for the overall coordination,

planning, implementation and monitoring of REDD+ safeguards activities as well as activities proposed under EMP, R&RP, IP&VCDP and GDP.

Regional REDD+ Focal Office (RRFO) at the regional forest office will have oversight and monitoring responsibilities over the respective District Forest Offices / or PA Offices/ or Protection Area (PA) offices and line agencies that will be implementing the REDD+ safeguard activities.

At **district** level, an Environment and Social Section (ESC) will be established in each District/PA REDD+ Program Management Unit (DRPMU) to handle environmental and social concerns.

At the **local** level, a REDD+ social and environment network (SEN) will be formed in each Village Development Committees (VDCs) having REDD+ projects. The SEF will be comprised of representative from VDC, Forest User Groups, farmer groups, IPs, Dalits, women and local community leaders.

V. Reference Level *{3}*

V.a Available data sets

Table 1 in chapter III above already eluded to the fact that the availability of accurate and reliable information remains a major problem for the analysis of forest cover and land-use change in Nepal. The most comprehensive yet non-compatible data sets are the data from the Land Resource Mapping Project 1976-1984 (LRMP 1986) and the data from the Forest Resource Assessment (FRA) project (2010-2014) of the DFRS. The FRA has published reports for the Tarai (FRA/DFRS 2014) and Churia Forests (DFRS 2014) with species-wise growing stock, biomass and carbon stock (above ground and below ground) by forest type, and development region. FRA did also apply LiDAR technology on Tarai Arc Landscape area (TAL); the so-called Lidar-Assisted Multi-source Program (LAMP) method *{3.3}* to generate forest biomass maps and activity data to create a RL for the period 1999-2011 for the 12 districts of TAL area. Similar reports for remaining physiographic regions are expected to be published soon but hitherto unavailable. This leaves the determination of a national reference level (RL) for now a daunting, if not to say, impossible task. At most sub-national RLs could be constructed for Tarai or Churia.

Constructing a RL is an exercise of critical importance: once set, reviewed, approved, and fixed countries will be held accountable against it. Therefore, it is an exercise that should not be taken lightly or be rushed. However, the UNFCCC decision allow for a phased approach and amelioration over time whereby countries can develop a RL based on available data and update and refine the RL with new data and improved methodologies becoming available overtime. At this stage, the procedure to determine the RL has been described (see below) but the actual quantification has not been done yet.

V.b Method for the construction of the RL

Constructing a RL will follow the phased approach as suggested by the UNFCCC Decision 12/CP.17 "Guidance on systems for providing information on how safeguards are addressed and respected and modalities relating to forest reference emission levels and forest reference levels as referred to in decision 1/CP.16". This allows the use of available data (even if uncertain) to provide a starting point for RL establishment with simple projections, based on historical data (Step 1), progressively updating the RL based on more robust national datasets for country-appropriate extrapolations and adjustments (Step 2) and ultimately basing the RL on more spatially explicit activity data and driver-specific information support (Step 3). *{3.3}*

A first exercise following this approach was conducted for the Tarai Arc Landscape (TAL) using the LAMP method as mentioned above. In case of LAMP only a small sample (less than 2 % coverage) of airborne lidar data needs to be acquired once. Then, the reference level can be updated as new satellite data and field surveys (for verification) become available. A further description of the deployed LAMP method in the TAL can be found in section *{3.3}*. The methodology is the outcome of a collaboration between Nepalese and international experts, was discussed with stakeholders from the REDD-Cell, and has been endorsed by the Forest Carbon Partnership Facility (FCPF) of the World Bank.

Once a LAMP campaign has been completed, further adjustment of RLs can be conducted by repeating the same analysis over a more recent set of years, especially if there appears to be a deviation in the rate of deforestation and forest degradation, but new Lidar or field campaigns are not necessary for the sake of the RL adjustment. It can be applied to generate RLs either at Tier2 or Tier3 spatial levels and has therefore, the potential to be upgraded to higher spatial resolution. Most parts of the method are based on an automated process that can be integrated into an operational system. Necessary tools have been developed and are available for RL calculation at national or sub-national level. *{3.4}*

VI. Nepal's National Forest Monitoring System (NFMS)

VI.a Design of an Operational MRV approach *{4.1.1}*

MRV systems allow the measurement, reporting and verification of changes in carbon stocks and in emissions and removals of greenhouse gases. The system foreseen will integrate or 'nest' national, sub-national/district and management unit level covering all existing levels. The information produced by the MRV system will be integrated into the NaFIMS to be shared with relevant stakeholders.

The design of the monitoring system can build on the activities conducted under the FRA project and the work already carried out for the TAL. The design of a monitoring system is closely linked with the technical approach for calculating emissions and removals since the system will be designed to monitor

carbon stock changes over time. It can be based on a combined method using remote sensing data and periodic ground measurements throughout all major forest types in Nepal. Local communities can be integrated as much as possible in the monitoring activities. The system will support decision making related to REDD+ strategy options. It will provide information to governmental organisations, NGOs, research institutions, the public and other relevant institutions.

It is envisaged that Nepal will use spatially explicit activity data and forest strata level emission factors within the present context. Quantification of emission factors can qualitatively be further improved after capacity building has taken place. The TAL LAMP method in its current form can be applied to provide both Tier 2 and Tier 3 data and provides data on changes in carbon stock at 1 hectare resolution.

In order to ensure effective, efficient and transparent governance of measurement, monitoring and management of data under the MRV system, DFRS, the national MRV Implementing agency, under the overall guidance of the Apex Body, will be responsible for:

1. Periodic execution of forest assessments for deforestation and degradation monitoring;
2. Designing, maintaining and operating the National Forest Information Management System (NAFIMS);
3. Coordinating the collection of sub-national level information;
4. Disseminating NAFIMS deliverables through web portal;
5. Providing technical guidance and institutional/capacity support to the parallel institutional setups at sub-national/district/local community levels

VI.b The National Forest Information Management System (NAFIMS)

The FRA Nepal project has developed an Open Source Forest Information System (OSFIS). This system in its current stage manages the inventory data, spatial data sets and also has a standard platform for data dissemination. The OSFIS, however may not be considered as a full Management Information System as the system is primarily designed for the ongoing inventory only. It needs to be upgraded to enable continuous monitoring of the permanent sample plots with advance UIs and modules and database structure.

The NAFIMS system should be based on a reliable and efficient platform that does not require extensive expertise in Information Technology to maintain. The system should be accessible for the general public through internet. This requirement requires to a solution based on Software as a Service (SaaS) that resides on a cloud and is accessible through a web application.

Ever since Google Maps has become ubiquitous, the benefits of accessible and easy-to-use map services have become increasingly obvious to users of Geographic Information. A browser is all that is needed to study thematic maps, even forest maps, in detail. The user interfaces of such WebGIS systems are easy to learn and use. And most importantly, all information is backed up frequently, so that hardware crashes and other calamities will not destroy valuable information and not even decrease their usability by much.

Other benefits of WebGIS systems include modular upgrades to different functionalities in the system. Web-based information systems consist of individual and independent functions that share common access interfaces. These interfaces are very often based on and supported by standards developed by the Open GIS Consortium (OGC) so that they have the widest possible extendibility with other sources of maps and other thematic layers, as well as with different GIS systems that can be used for deeper analysis or for the production of specialized forest information layers.

The NAFIMS will need to be designed as an overarching information management system that includes tools and protocols for system managers and interfaces for accessing data, information and maps from the NFD and other relevant databases, links to and between these databases, analysis, synthesis, tabulation and other thematic tools. The NAFIMS will ideally include tools for decision support modules and user friendly graphical user interfaces for data query and reporting, GIS analysis and mapping. The GIS module will include standard web mapping interfaces and tools.

The information system will be developed using open source application platforms with industry standard administration and management interfaces and it will deployed in the web as a "software-as-a service (SAS)" system. Standard operating protocol will be developed for accessing data and information through NAFIMS. Key modules to be included are forest resources, forest carbon, working plan and programs, users and beneficiaries, remote sensing, Land use, Land-use Change, and Forestry (LULUCF), REDD activities and social and environmental safeguards (SES) indicators.

The NAFIMS will be deployed through hosting in a dedicated web application server to be based in GIDC which has facilities for space, continuous power supply, high speed internet connectivity, security and technical support. A backup server will be set up at the National Information and Technology Centre (NITC), Singh Durbar, Kathmandu.

A study is underway that will develop guidelines for institutional coordination and standard operating procedures of NAFIMS. Recommendations will be prepared for the institutional management of the system including manpower, computer hardware and software to ensure system sustainability and use. Relevant government staff will be trained to operate, maintain and administer the NAFIMS. After operationalization continued support for system operation should be secured through procurement of maintenance services.

Part II: supporting and background information

This Part contains all background and supporting information on the basis of which Part I has been constructed. The outline for this part was a given, generated in a multi-stakeholder collaboration and consultation process conducted in 2012, complemented by some new elements that emerged in the international climate arena since then.

1. GUIDING FEATURES OF NEPAL'S REDD+ STRATEGY

1.1 Strategic Directions

1.1.1 Vision

Optimize carbon and non-carbon benefits of forest ecosystems for the prosperity of the people of Nepal.

1.1.2 Mission

To strengthen the integrity and resilience of forest ecosystems, and improve socio-economic and environmental values of forests for communities by improving policy and legal measures, augmenting institutional functioning, and enhancing stakeholders' capacity and capability.

1.1.3 Objectives

1. To reduce carbon emission by intensifying sustainable management of forest resources and minimizing the effects of drivers of deforestation and forest degradation across the ecological regions. (S # 1,2,3,4)[5]
2. To ensure fair and equitable distribution of carbon, non-carbon and environmental benefits of forests among right holders. (S # 5)
3. To increase livelihood assets, food security and diversify employment opportunities of forest dependent people, particularly poor and marginalized (S # 6,7,8)
4. To improve and harmonize policy and legal framework to harness carbon and co-benefits; strengthen institutional capability and improve governance of forest agencies. (S # 5,9,10,11,12)
5. To establish and maintain a robust Forest Management Information System with strong monitoring, reporting and verification mechanisms (S # 13)

1.1.4 Guiding Principles

The National REDD+ Strategy and its implementation will be guided by the following values and guiding principles:

1. Synergetic alignment with overall development strategies

The National REDD+ Strategy and its implementation will align with overall development strategies such as poverty reduction, livelihood improvement and equitable and inclusive development of the country to produce synergetic outcomes. More specifically, it will align with the Forestry Sector's vision of

[5] The S# numbers correspond to the Strategic Objectives that are introduced later in the report.

optimizing the potentials of forest ecosystems, sustainable management of forests, and conservation of biodiversity and watersheds for peoples' prosperity. It will also be fully in harmony with upcoming constitutional provisions of institutional, governance, and federal arrangements including distribution and management of Natural Resources.

2. Building on the successful community-based approaches and practices

The REDD + Strategy and its options will build on the successful experience and practices of participatory approaches of reducing deforestation and forest degradation, and forest conservation and enhancement. The interaction among different stakeholders will follow complex adaptive approach[6] to forest conservation, management, decision-making and benefit sharing.

3. ***Enhanced coordination and harmony among different sectors and agencies***

Coordination among different stakeholders and government agencies is essential for effective implementation of REDD+ strategy and ensure sustainability. Effective participatory and consultative process will be practiced. Multi-stakeholder engagement in planning, decision-making, implementation and monitoring at different level will be ensured with enhanced commitment, ownership and mutual cooperation. The efforts will be made to avoid conflicts and contradictions between sectoral policies and programs of forestry, biodiversity, environment, agriculture, local development, energy, and infrastructure development.

4. Utilizing and building on the existing capacity and capabilities

In implementing REDD+ strategy and sharing benefit from REDD + the existing capacity of human resources and capability of multi-stakeholder institutions at national and sub-national level will be utilized. In order to actively engage and contribute in the REDD + mechanism, capacity building of all relevant stakeholders and institutions will be emphasized. The capacity will be enhanced on the general concept of REDD+, Strategy and mechanism, Monitoring, Reporting and Verification, Forest carbon trade and benefit sharing.

5. Capturing fully the wide range of ecosystem benefits

The REDD+ mechanism will aim to capture the optimum value of the wide range of ecosystem benefits coming from the forests. That includes the promotion of biological diversity, integrated watershed management, and balancing between the sustainable development and economic prosperity of people, particularly forest dependent communities. The maintenance of ecological integrity - integrated management of land, water and living resources to promote conservation and sustainable use, and the

[6] The complex adaptive approach is a process of interaction among different agents, where each agent learns, adapts and generates collaborative actions for better outcomes and for mutual benefits.

practice of ecosystem adaptive approaches -management practices and decision making processes adopting the process of learning, will be an important guiding principle.

6. People-centric practices and approaches

The people will be at the heart of every REDD+ mechanisms. The people centric practices and approaches will be followed in all REDD+ related policy formulation, implementation, benefit sharing, monitoring and evaluation.

7. Equitable benefit sharing and social justice

Fairness, equity and social justice will be the basis for sharing the benefits of REDD+. Equitable access to information, decision-making, justice, and benefit sharing of poor, women, *dalits, janjatis, adibasi* and other marginalised people for their social and economic upliftment will be ensured.

8. Social, environmental, cultural and economic safeguards

Effective safeguards for social, environmental, cultural, and economic rights will be ensured with grievance redress mechanisms in the REDD plus implementation. Customary rights and practices of indigenous people and people's rights to free, prior and informed consent will be duly recognized.

9. ***Effective and efficient monitoring and information system***

A robust national forest information and monitoring system will be developed and a well functioning, credible national measuring, reporting and verification (MRV) system will be promoted.

10. Transparency and accountability

REDD plus implementation will promote good forest governance that ensures the transparency, accountability, and integrity of actions. It will be ensured that the double counting of carbon credits avoided.

1.1.5 Scope

The following categories of forests and protected areas as identified by Forest Act (1993), National Parks and Wildlife Conservation Act (1973) and Forest Policy (2000) will be included under REDD+ mechanism, applying the forest definition as defined by the UNFCCC (2001).[7]

a) Government Managed Forests

b) Protection Forests

[7] UNFCC (2001) defines the “forest” as "a single minimum tree crown cover value between 10 and 30 per cent, a single minimum land area value between 0.05 and 1 hectare and a single minimum tree height value between 2 and 5 metres.

c) Community Forests

d) Collaborative Forests

e) National Park

f) Wildlife Reserve

g) Hunting Reserve

h) Conservation Area

i) Buffer zone

The possibility of Leasehold forests, Religious forests, Public land forests and Private forest will be explored and included at a later stage.

From the five-carbon pools, above ground and below ground biomass will be included in the beginning, and as time moves forward, other carbon pools (dead wood, litter and soil carbon) may be included as Nepal improves its capacity, Reference Emission Level and technology to monitor, measure, verify and report on emissions and removals associated with REDD+ activities.

1.1.6 Scale

A nested approach with national and sub-national level complementing each other will be followed. The national government will implement policy reforms, make institutional arrangements, set up Monitoring and Measuring, Reporting and Verification (M&MRV) systems, and get incentives from the available international arrangements, while aiming to operationalise benefit sharing, financing and monitoring activities at the sub-national level. REDD+ activities and regular/periodic carbon monitoring at the subnational level will as much as possible be conducted by the communities that have the delegated authority for the forest management and who have the capacity to do so, whilst receiving technical support from local forest authority. All international incentives will be received at the national level and the national government will incentivize REDD+ actions at subnational levels with an agreed benefit sharing mechanisms.

1.1.7 Implementation Approach

Nepal's approach to the implementation of REDD+ will take place in three phases that may overlap, as discussed by Wertz-Kanounnikoff and Angelsen (2009). The first phase is currently implemented as *'readiness'*, where a number of activities such as strategy preparation, studies, capacity development, demonstration, consultations are being implemented. The second phase is *'more advanced readiness'*, where policies and measures to reduce emissions will be implemented, and further capacity building, and review of institutions and processes will take place. The third phase will be full UNFCC *'compliance'*, where compensation for reduced emissions and enhanced carbon stocks will be made. During the

compliance phase the first five-year period will be the 'first compliance ' and second five-year period as 'second compliance' phase.

1.1.8 Financing Mechanism, Forest Reference Level (RL) and Forest Carbon Trust Fund

The Warsaw decision on REDD finance states that adequate and predictable payments should go to the Global South to stop deforestation and forest degradation. The decision focuses on results, qualified as performance-based finance. However, there is still debate on the suitable financing mechanism.

Generally, REDD+ activities in developing countries like Nepal can be financed through three main options:

(i) a voluntary fund could operate at the national (i.e. uni- or multilateral) or international scale raising funds e.g. from Official Development Assistance (ODA) and other public and private sources;

(ii) a direct market mechanism for REDD credits could be traded alongside existing certified (or verified) emissions reductions (CERs), and could be used by companies in countries to meet emissions targets in their national cap-and-trade systems; or

(iii) a hybrid/market-linked mechanism would generate finances through either an auction process or by establishing a dual-market in which REDD credits are linked to but are not fungible with existing CERs.

Recent developments, weaknesses and strengths of each option suggest that a combination of these approaches may be needed to address the specific forest and socioeconomic conditions. But a common yardstick is that there is a good governance system in place to make contractual and performance-based REDD+ financing effective. Broadly, Nepal intends to follow a hybrid approach but it is essential that better options are explored after examining more intensively the strengths and weaknesses of each option.

In parallel, development of internal effective and equitable payment mechanism is one of the most important and challenging aspects of the REDD+. In this respect, ICIMOD and its partners have created a Forest Carbon Trust Fund (FCTF). With such a created fund, pilot projects in three watersheds of Gorkha, Chitwan and Dolakha districts have been completed. Under the project, a performance-based financial support was given to the local communities for an incentive to conserve forest and prevent deforestation (ICIMOD, 2013). The pilot projects have given valuable lessons to be useful for developing financial mechanism and operating trust fund more judiciously.

Closely linked to financing mechanism is the Forest Reference Level (FRL). This is essential for quantifying reducing emissions from deforestation and forest degradation, conservation of forest carbon stocks, sustainable management of forests and enhancement of forest carbon stocks. Generally, FRLs depict a business-as-usual (BAU) emission scenario, thereby providing a benchmark for estimating emission reductions due to REDD+ implementation. A FRL is also required to determine eligibility for

international, results-based support for REDD+, and to quantify the entitlement on the basis of emission reductions that can be measured and verified.

A FRL generally takes historic emissions and removals into account, and is adjusted as required by national circumstances. Nepal is in the process of determining its FRL by exploring more robust methodological options.

In view of close links amongst financing mechanisms, forest reference levels and the forest carbon trust fund, an autonomous organization to deal with all these activities may be needed. In Nepal comparable structures already exist. For instance, autonomous organizations like the Alternative Energy Promotion Centre (AEPC) are working successfully with little interference by the government despite the main chief executive being appointed by it; whilst for instance the Poverty Alleviation Fund (PAF) is more autonomous as it is governed by a separate act.

Despite funds being made available through government budgetary processes, the funds are allocated or utilized by these organizations based on their own criteria enshrined in their regulations. Similar organizational arrangement may be warranted for REDD+ and will be the key for reaping benefits from REDD+ by various stakeholders, forest dependent communities and the country as a whole.

1.2 Existing Policy and Institutional Context for REDD+

The development and implementation of a robust REDD+ strategy requires designing suitable legal and institutional framework and removing policy bottlenecks. From the same objective, a brief review of policies, rules and regulations of related areas is made below.

1.2.1 Forest Policy, Acts and Regulations

The Forest Act of 1993, the Forest Regulations of 1995, and the Forestry Sector Policy of 2000 are the major legal and policy foundations of forestry management in Nepal. The Forest Act of 1993 broadly divides forests into two ownership categories: national and private. Except categorized as private, all others are national forests. The forests categorized by the Act are as follows:

1) **National Forests:** All forests other than private forest, regardless of the demarcation of their boundaries and including cultivated or uncultivated land, roads, ponds, lakes, rivers, streams and the shingly land that is surrounded by or in the vicinity of a forest.
2) **Government Managed Forests**:National forests managed by the government.
3) **Protection Forests:**National forests that the government has declared protected in consideration of their environmental, scientific and cultural importance.
4) **Community Forests:** National forests that have been entrusted to user groups (as defined in clause 25 of the act) for development, conservation and utilization in the interest of the community.

5) **Leasehold Forests**: National forests that have been leased (according to clause 32 of the act) for specified purpose(s) to a legally defined institution, forest-based industry or community.

6) **Religious Forests**: National forests that have been entrusted to any religious entity, group or community as specified in clause 35 of the act.

7) **Private Forests**: The planted or protected forest on land that belongs to an individual per the prevailing law.

The Forest Regulation 1995 gives details on the forms and modalities of separate regulatory arrangements on the above classified forests. For each type of forests separate institutional responsibility, authority at different levels and procedures to obtain licenses for marketing of forest products including limits are explicitly given.

Forestry Sector Policy of 2000: The new forestry policy was brought out in 2000 amidst heavy pressures on the forests. As stated, it was guided by the objectives of basic needs satisfaction, sustainable utilization of forestry resources, participation of people in decision making and socio-economic development. Main salient feature of the policy is that it in addition to outlining the long, medium and long term objectives brings about certain shift in the traditional role of the state in this area by assigning key role to the community for the conservation and management of the forest. With this policy, the collaborative forest management system was also introduced in some of the Tarai districts. Currently, MFSC is in process of preparing forest policy and forest sector strategy. More broadly, the forest policy and the strategy will be the key in the context of REDD+. Section 2.3.1 reviews the specific strengths and shortcoming of the Forest Laws and Policies in the context of REDD+.

Other relevant policies are elaborated in Annex 1 and include:

Land Use Policy 2012:

- Climate Change Policy 2011:
- Rangeland Policy 2012:
- National Parks and Wildlife Conservation Acts and Regulations:
- National Biodiversity Strategy and Action Plan:
- National Wetlands Policy:
- National Water Policy/Strategy:
- National Irrigation Policy:
- National Hydro-power Policy:
- Environment Act and Regulations (EIA guidelines for sectors):

National Adaptation Plan of Action (NAPA) and Local Adaptation Plan of Action (LAPA):

- National Framework on Local Adaptation Plan for Action (LAPA) in 2011

A quick review of forest and other related sector laws, regulations, policies and adaptation plans, both relatively old and new ones, indicate that their coverage is quite comprehensive in the context of REDD+. Issues associated with alternative land use, forest conservation and utilization, irrigation and water resource use, environment and climate change, which are broadly linked to overall sustainable development, are covered one way or another. Strong enforcement in a coordinated and effective way ensuring complementary of all these would have minimized the problem of deforestation and forest degradation to a greater extent. But a number of constraining factors are working adversely or less favorably largely emanating from more sector specific functional approach followed by different institutions while formulating laws or policies. This has compounded the problem of coordination, overlaps and conflicts pervasively. The ambiguities or lack of clarity on absolute or collective responsibility has made the enforcement and accountability a major problem, both horizontally and vertically.

1.2.2 Ongoing Targeted Support of UN-REDD

In June 2014 Targeted Support (TS) to Nepal has been agreed between UN-REDD and the GoN related to the feasibility of strategic options and REDD+ finance architecture. To some extend this document and the outcome of the TS need to be dovetailed.

The TS is to deliver a set of methodologies to identify and assess REDD+ strategic options for Policies and Measures, to monitor the implementation and performance, and to link this to a national REDD+ finance mechanism. The expectation is that the strategic options as formulated in the fore lying document will be taken forward in the TS to be further refined and processed into a more detailed national institutional framework and will be embedded in an improved Policies, Legislation and Regulation (PLR) framework.

In advance of the PLR review that will be undertaken in the context of the TS, and without prejudging the finding, in section 1.2.3 a review is already presented of the specific strengths and shortcoming of the Forest Laws and Policies in the context of REDD+ that can already be identified at this stage.

1.2.3 Forest, Biodiversity, Environment and Climate Change: the legal framework in Nepal

This section reviews the existing Nepal's forest, biodiversity, environment and climate change related policies and legal framework.

Forest, biodiversity and watershed:

Forestry sector in Nepal have gone through several changes, and there has been a constant flux in the ways in which forests were owned and managed during pre-unification times, unification period, the Rana rule and post-Rana rule. In the post-Rana rule (after 1950) the government attempted to undo the

accumulation of forest as property in the hands of limited number of ruling elites and Rana clan members and nationalized the forests with the enforcement of Nationalization of Private Forests Act 1957. To facilitate the implementation of the nationalization, two stringent acts- the Forest Act in 1961 and the Forest Preservation (Special Arrangement) act in 1967 were introduced and the department of forest was made quite strong for law enforcement. These two acts were unified and a more liberal forestry act in 1993 and forest regulation in 1995 were enacted to promote community forestry in the country. Since then, a number of directives, manuals and operational guidelines have been developed and/or amended to address the emerging socioeconomic, political and biophysical context.

For the conservation of biodiversity and ecosystem a number of legal and policy measures were prepared and implemented. These include the National Parks and Wildlife Conservation (NPWC) Act 1973 and various regulations; National Biodiversity Strategy and Implementation Plan (2014) and many strategies, plans, and guidelines related to buffer zone, landscape, wildlife farming. (See Annex 1 for the lists). The conservation policies have taken a paradigmatic shift from 'people exclusionary' and 'species focused' to ' people-centered community based' and 'ecosystem/landscape approach' in the past two decades (Sharma et al, 2010; Sharma, 2012). A number of regulations were made to help implement the provisions of the act (See annex for the lists). The amendments of the NPWC Act 1973 and related regulations have tried to respond to the changing socio-ecological contexts and the international conservation policies and discourses (Paudel et al, 2011). They have tried to link conservation with development, to redistribute park revenue to local communities, and to transfer more rights and responsibilities to the institutions of local people through buffer zone programme and conservation areas approach.

As a national CBD focal point, the MFSC has been pursuing policies and strategies to implement its commitments. After expiration of Nepal Biodiversity Strategy (2002) and Nepal Biodiversity Strategy Implementation Plan (2006-2010) the Ministry has drafted National Biodiversity Strategy and Action Plan (NBSAP) 2014. This strategy and action plan has aimed to address the emerging second and third generation issues of equity, social inclusion and climate change with eight principles and 15 broad strategic approaches.

Regarding **climate change** NBSAP has proposed 2 major strategic goals, 8 sub goals and 24 priority actions.

The National Wetland Policy is developed in 2012 aiming for the sustainable management of **wetlands**. A number of strategic plans are prepared and implemented for the conservation, livelihood development and ecological integrity at landscape levels. The Soil Conservation and Watershed Conservation Act 1982 were enacted with provision of declaring 'protected watershed' and land management according to land capability. However, the implementation of this act is limited.

Environment and climate change: Nepal is a signatory to more than 20 Multilateral Environmental Agreements (MEAs) including the UN Convention on Biological Diversity (CBD) (1992), UN Framework Convention on Climate Change (UNFCCC) (1992) and the Kyoto Protocol (1997). To fulfill the

commitments of MEAs a number of policies and law have been formulated. After signing the CBD in 1992, Nepal enacted the Environment Protection Act, 1996 and the Environment Protection Regulations, 1997, which make Environmental Impact Assessment of development actions mandatory and delineates scope and procedures for the assessment. As pointed out above, a Climate Change Policy was adopted in 2011 covering wide areas of climate change issues with a goal of improving livelihoods by mitigating and adapting to the adverse impacts of climate change. It aims to adopt low-carbon emission-based socio-economic development and proper utilization, promotion, and conservation of forest resources as a means of alternative livelihoods. The policy has encouraged carbon sequestration by controlling forest fire and conserving forests and has identified sustainable management of forests, agro-forestry, and soil conservation to address the impacts of climate change.

Nepal has also prepared the National Adaptation Programme of Action (NAPA) and National Framework on Local Adaptation Plans of Action (LAPAs) to respond the requirements of UNFCCC as already pointed out.

NAPA provides strategic tools to assess climate vulnerability and systematically respond to climate change adaptation issues. It has proposed watershed and landscape level planning. It has provided strategic guidance and actions in nine high priority areas to increase communities adaptive capacity through livelihoods support, improved resource governance, collective responses, improved service delivery mechanisms, and access to green technology and finance. Major programmes identified by NAPA in forestry are: Community Based Forest Fire Control; Control of invasive species; Integrated forest management for water; Integrated watershed Management; Wildlife Management in relation to climate stress; Vulnerable species conservation; High altitude Range land conservation; Management of Wetlands; Conservation of riverine forest; Trees outside forest or agroforestry in communal and private land; Private Land Conservation Forestry; Collection and Maintenance of Biodiversity Database; and Payment of Environmental Services.

In order to integrate climate adaptation and resilience into local level planning and implement the National Framework on Local Adaptation Plan for Action (LAPA) was prepared in 2011. The framework has identified seven steps of LAPA formulation and implementation in order to ensure integration and implementation of climate adaptation and resilience actions into sectoral plans, programme and projects, and make people, community and their resources are adaptive to climate change.

1.2.4 Social & Environmental Safeguards Policies in the Context of REDD+

Nepal is committed to developing and enforcing REDD+ social and environmental safeguards during the further refinement and implementation of this strategy. It has been recognized that implementation of REDD+ can pose significant environmental and social risks, as well as provide an opportunity to promote multiple benefits. Potential benefits include the promotion of biodiversity conservation and securing the provision of ecosystem services including water regulation, timber production, erosion control and the supply of non-timber forest products. In addition, REDD+ can result in social benefits such as improvements in governance and livelihoods, and the clarification of land tenure.

The potential risks posed by REDD+ include, amongst others, appropriation of local communities and indigenous peoples' lands (involuntary displacement), other human rights violations, and depletion of biodiversity causing depletion of sources of livelihoods for forest dependent communities.

In principle, Nepal has a well-established legal system to implement and include environmental and social safeguards in development activities. This section and Annex 1 provides an overview of policy and legislative provisions that are relevant to minimize adverse and enhance beneficial impacts while implementing the REDD+ strategy. This is without precedent over the work that is ongoing under the Technical Support provided by UN-REDD and executed by the FAO related to the broader analysis of Policies, Legislation and Regulations (PLR); this will provide more a comprehensive outlook on Nepal's relevant PLR.

1.2.4.1 Relevant Policies and Regulations related to Social & Environmental Safeguards

The GON has executed sectoral policies, enacted acts and regulations, developed guidelines and manuals, and has signed international treaties and conventions, some of which have provisions for social development and safeguard. The prevailing Acts, policies, regulations, conventions and guidelines related to social development and safeguards of Indigenous Peoples (IPs) and vulnerable communities including Dalits have been reviewed as per the requirements of UNFCCC REDD+ safeguards.

Likewise, the ILO Convention No.169 on Indigenous and Tribal Peoples enacted in 1989 and the United Nations Declaration on the Rights of Indigenous Peoples (2007) both ratified by Nepal in 2007 have also been reviewed and discussed.

In addition, international agencies that are already financing REDD+ projects and may continue to do so in future under a climate regime that formalizes a REDD+ mechanism, have requirements in place to ensure that their social and environmental safeguard policies are adopted while planning and implementing the projects. In this context, the World Bank's social safeguard policies have been reviewed. The objective of these policies is to prevent and mitigate undue harm to the people as a result of the projects financed under the World Bank. These policies provide guidelines for the identification, preparation, and implementation of programs and projects. The main social safeguard policies to be triggered under REDD+ projects will be OP 4.11 on Cultural Property, OP 4.12 on Involuntary Resettlement and OP 4.10 on Indigenous Peoples. These policies have been reviewed.

The policies and regulation related to safeguard in the context of implementation of REDD+ strategy can be categorized broadly into following three groups:

4) Policies and regulation related to land acquisition, compensation and resettlement
5) Safeguard of Indigenous Peoples(IPs) and other Vulnerable Communities (VCs)
6) Good governance, social accountability and public consultation

1.2.4.2 Land Acquisition, Compensation and Resettlement

The REDD+ strategy implementation in Nepal has not been envisioned any involuntary resettlement and involuntary land acquisition. However an assessment regulatory provisions and policy regime related to land acquisition and associated impacts would be beneficial if some reasons involuntary land taking occurred while implementing the REDD+ strategy. The Interim Constitution (2007) guarantees the right to property and the right to compensation for property acquired under the law and, there are numbers of legislations covering land acquisition/appropriation, in Nepal.

The review of the prevailing Acts and Regulations related to land acquisition, compensation and resettlement (see annex for detail findings of the review) in Nepal indicates a progressive development of legal framework related to involuntary resettlement of the people affected by the development projects. However, Nepal does not have legislation that specifically addresses involuntary resettlement. For example, the only act related to land acquisition, Land Acquisition Act 1977(LAA 1977) has no specific provision for granting compensation to project affected people who do not have legal ownership of land. This is contradictory to the World Bank Policy on Involuntary Resettlement (OP 4.12) which states clearly that 'absence of legal title to land should not be a bar for compensation, resettlement, and rehabilitation assistance'. Similarly, there are no provisions of compensation, resettlement and rehabilitation for traditional users of the property, communal properties, and the users of the properties for generations without legal holdings. Though the LAA 1977 recognizes that the affected people are eligible for compensation of the affected land and property, the mode of compensation is not exclusively defined. In practice, it refers to cash compensation. Further, the property evaluation aspect is rested upon the Compensation Fixation Committee without any guidelines. It is not clear whether the evaluation criteria will be based on the current market price or on the prevailing rates of Land Revenue Office. In Nepal, Land Revenue Office rates are far lower than the current market price. Compensation payments are usually made only after deduction of depreciation, which is against the best practices, adopted by the guidelines of the many international donor agencies including ADB and World Bank. Nevertheless, resettlement has been addressed on a project specific basis as per the guidelines of World Bank since late 1980s and ADB since the beginning of 1995. Therefore, project specific resettlement policy and Resettlement Action Plan are required to formulate based on the findings of screening and ESIA while implementing REDD+ projects.

1.2.4.3 Safeguard of Indigenous Peoples (IPs) and other Vulnerable Communities

Nepal does not have a standalone policy on Indigenous Peoples and other vulnerable communities. The Interim Constitution of Nepal 2063 (2007), NFDIN Act 2002, Local Self-Governance Act, 1999, Forest Act (1993) and Forest Regulation (1995) and periodic Five Year Plans have been placed significant emphasis on social development and delivering basic services to the disadvantaged and indigenous people, Dalits, women, disabled and other vulnerable groups while implementing any development programs and projects. For example, the Interim Constitution of Nepal 2063 (2007), Article 35, Policies of the State (10) mentions that the State has compulsory obligation to pursue a policy of uplifting the economically

and socially backward indigenous peoples, Madhesi, Dalit, marginalized communities, and workers and farmers living below the poverty line, by making a provision of reservation in education, health, housing, food sovereignty and employment.

Similarly, the Forest Act 1993 and Rules (1995) provide numbers of rights to Nepalese citizens who depend on forest and who are willing to be the members of a CFUG: a) right to get organized with perpetual succession, b) entitlement over forest growing stock, c) right to use 100% benefits resulting from the sustainable yields, c) unalienable citizen rights even if a community forest is withdrawn by the government in case a particular CFUG executive committee does not meet sustainability standards in forest management. These rights have significant incentives and motivated local forest dependent citizens to participate in forest governance. These rights are also exercised through other modes of citizen participation within CFUG that include a wide array of institutional mechanisms such as Tole (hamlet) based decision making, elect executive committee, development of group constitution, annual assemblies, development of forest management plans. Sometimes there are women-only groups, specific interest based sub-groups and the like.

These constitutional and legal provisions are supplemented with the provisions under the United Nations Declaration on the Rights of Indigenous Peoples (2007) and International Labor Organization (ILO) Convention (169), 1989 in 2007 since Nepal is a signatory to these international legal instruments. The ILO Convention no. 169 of 1989 is the most comprehensive legally binding treaty on the rights of indigenous peoples. The Convention includes provisions on cultural integrity, land and resource rights and non-discrimination, and instructs states to consult indigenous peoples in all decisions affecting them. Articles 1-4 of the United Nations Declaration on the Rights of Indigenous Peoples (2007) ensures the individual and collective rights of indigenous peoples, as well as their rights to culture, identity, language, employment, health, education and other issues while implementing any development activities in the traditional territory of the IP. Similarly WB Policy on Indigenous People (OP 4.10) emphasizes to avoid potentially adverse effects on the Indigenous Peoples' communities as a result of development process under the Bank finance or when avoidance is not feasible, the proponent of the projects must minimize, mitigate, or compensate for such effects. The detail findings of the legal provisions to safeguard IPs and other vulnerable communities are presented in Annex 1.

Despite Nepal's commitment to implement national and international policies on IPs, in practice, however effective implementation of these provisions is rather week due to lack of monitoring mechanism and also due to absence of standalone Act on IPs and vulnerable communities. Therefore, REDD+ project specific IPs and Vulnerable Community Development Plan should be prepare and implement to ensure that REDD+ projects enhance opportunities for Indigenous Peoples and other vulnerable communities including Dalits to participate in, and benefit from, the REDD + activities in ways that do not threaten their dependence on forest, their unique cultural identities and well-being.

1.2.4.4 Good Governance, Social Accountability and Public Consultation

Good governance and social accountability measures are meant to make public officials answerable for the services they provide to the beneficiaries and common people. For this reason REDD+ project/activities implementing agencies should have in place policies for community consultation and participation and pro-poor development activities through active and meaningful involvement of stakeholders. There are numbers of GoN acts and international binding provisions to ensure good governance, accountability and meaningful public consultations (see annex 1 for details). For example, the clause 30 of the Good Governance (Management and Operation) Act, 2064 (2008) has a provision of public hearing. The Chief office-holder at regional, zonal, district and local level involved in delivery of service, shall conduct Public Hearing as prescribed, with the purpose of making the activities of the office fair, transparent, and objective and addressing the lawful concerns of general people and stakeholders. The act also mentions that subject matter expert, stakeholders, and representatives of civil society and officials of the local bodies shall be the participants of the public hearing. Similarly, the clause 31 of the act describes grievance redress mechanism and process.

The community based forestry program being implemented under the Forest Act (1993) and Forest Regulation (1995) can be considered as a model of direct democracy at the local level regarding forest management. Nepal's community based forestry program is probably the largest sectoral domain of governance in terms of the number of citizens directly engaged, surpassing even the largest political party in Nepal.

However, just formulation and devolution of policy does not guarantee participation of all. While participation of elite members of civil society has improved governance when compared with the state management of forest, the continuing challenge is to understand how marginalized members of civil society can equally participate in the process. In many situations, foresters tend to undermine democratic deliberation. Even when right to manage forests has been transferred to local communities, in many situations forest officials are found to exercise extra-legal and significant degree of influence through technical knowledge (Ojha et al 2008). These issues require addressing categorically through policy reform and awareness raising to ensure equal participation of all stakeholders in forest governance irrespective of caste, ethnicity, gender, economic status and remoteness.

The above discussions show that there are some legal provisions in line with FPIC requirements as prescribed by REDD decisions under the UNFCCC and applied by financing institutions and donor organizations active (e.g. WB and UN) in the field of REDD+. But effective implementation of these provisions as per FPIC standard is a challenge. Therefore, REDD+ project specific information disclosure and consultation and participation plan needs to be developed. The plan should have mechanisms to engage with communities, groups, or individuals affected by REDD+ projects, and with civil society and other stakeholder, through information disclosure, consultation, and informed participation so that they can provide meaningful input into project design and mitigation measures.

2. REDD+ Strategy Preparation

2.1 Assessment of Land Use, Land -Use Change Drivers, Forest Law, Policy, Governance

2.1.1 Assessment of land use

This section presents the physiography, bio-climate and vegetation types of Nepal, discusses a brief history of land use and land cover change surveys, and analyses the trends of land use and land cover in different time series and in different physiographic regions.

2.1.1.1 Physiography, bio-climate and vegetation types

The physiography of Nepal ranges from tropical alluvial plains ascending from 60 m asl to the snow and ice covered Himalayan range that includes 8,848 m asl the highest peak the Mount Everest. There is no consistency in defining the physiographic regions, nevertheless five regions- High Himal, High Mountain, Mid-Mountain, *Churia* (*Churia*) and *Tarai* - are distinct characterised by unique socio-economic and biophysical features. The High Himal occupies about 23 percent of Nepal lying above 5,000 m between the upper limit of vegetation and the crest of the Himalayas. It is devoid of permanent human settlement. High Mountain occupies 19 percent of land with altitude between 3,000 m to 5,000 m, however its lower altitudinal boundary can reach as low as 1,000 m in valleys. This region is highly rich in endemic flora and fauna and settlements are scattered and isolated. The Middle Mountains comprises about 29 percent of Nepal situated generally in between 1,000 m to 2,000 m. It is composed of network of ridges and valleys extending to river bottom up to 200 m and ridges up to 3,000 m. It is characterised by landuse system with intricate and extensive mosaic of terraces and clusters of densely populated villages surrounded by small patches of forests. The *Churia* also known as *Churia*, comprises about 15 percent of land, are a series of low, hogback ridges that run through the length of Nepal towards south lying generally between 500 m to 1,000 m, however it reaches lower range up to 120 m and upper elevation up to 2,000 m. The *Churia* is highly fragile and sensitive to soil erosion and encloses a number of cultivated valleys known as *Inner Tarai* or *Duns*. The *Tarai*, covers about 14 percent of land bellow 500 m extending from the east to west in between the *Churia* and southern border to India. The land is highly productive agriculturally and is densely populated.

Table 5. Physiographic and Bioclimatic Zones, and Vegetation Types of Nepal

Physiographic Zone	Area (%)	Elevation (m)	Bioclimatic Zone	Vegetation Types
High Himal	23	Above 5,000	Nival (Tundra and	Montane grassland and shrublands

Physiographic Zone	Area (%)	Elevation (m)	Bioclimatic Zone	Vegetation Types
			Arctic)	
High Mountains	19	4,000-5,000	Alpine	Montane grassland and shrublands
		3,000-4,000	Sub-alpine	Sub-alpine conifer forest
Middle Mountains	29	2,000-3,000	Montane (Temperate)	Temperate broadleaved forest
		1,000-2,000	Subtropical	Tropical forest/sub-tropical conifer forest
Siwalik	15	500-1,000	Tropical	Sub-tropical broadleaved forest
Tarai	14	Below 500	Tropical	Sub-tropical broadleaved forest Grasslands, savannahs and shrublands

Source: Dobremez (1976); Biodiversity Profile Project (1995); MFSC, 2014; TISC, 2002

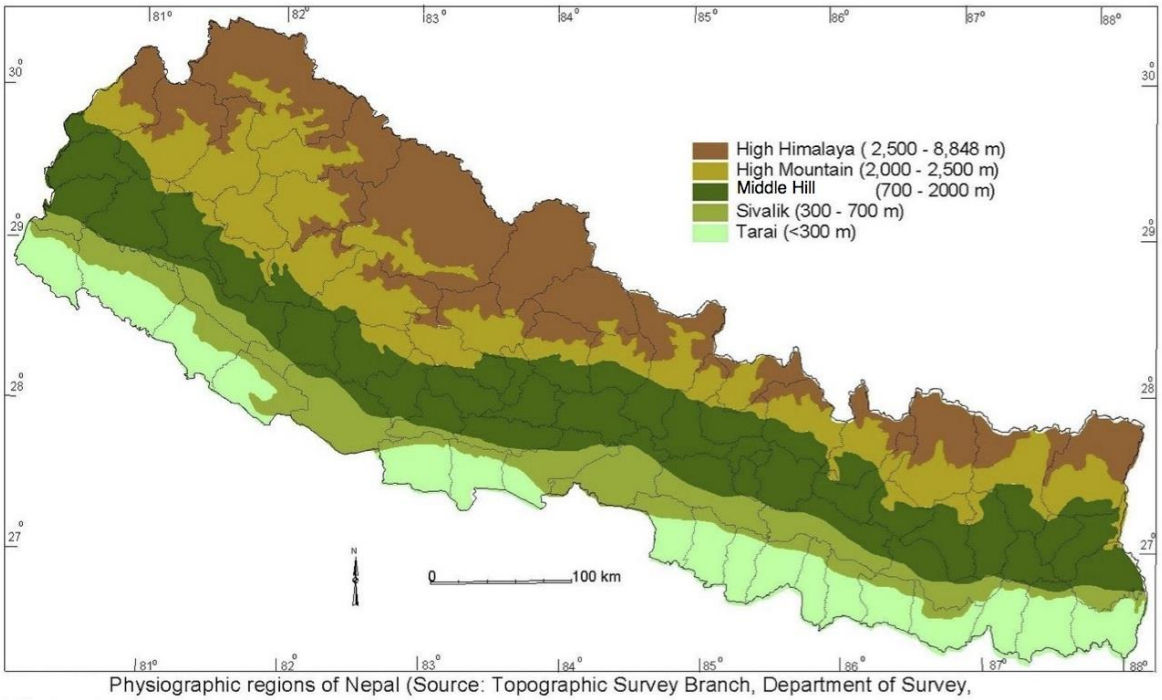

Figure 4. Map of Nepal showing major physiographic regions

The vegetation classification in Nepal is complex and cannot be strictly compartmentalized due to high biological diversity. Schweinfurtch (1957) provided a general framework to classify Himalayan vegetation types, which was followed by Dobremez (1976). Stainton (1972) and Dobremez (1976) provide a comprehensive vegetation classification. Dobremez with his Nepali colleagues totalled 198 categories of vegetation types distributed in six bio-climatic zones (TISC, 2002). These were further synthesized down to 118 by Biodiversity Profiles Project in 1995, which was further revised down to 59 by IUCN in 1998/1999 (ibid). These 59 types were further reduced to 36 by TISC (2002) and gave a further simplified ecological picture of Nepal's vegetation.

2.1.1.2 History of land use and land cover change survey and inventory

The history of land use survey in Nepal started in 1960s with the forest resources survey of 1963-1967. The survey covered the Tarai, Inner Tarai, Churia hills and Southern faces of Mahabharat range by classifying forests into accessible (commercial) and inaccessible (non-commercial) forests and the focus was only for commercial forests to estimate timber stock and domestic consumption of wood products (DFRS, 2014). Another comprehensive and extensive national level land use survey was carried out by Land Resource Mapping Project from 1977 to 1979 to map land cover and land use, produce forest cover maps and assess the type, size and crown cover of forests. The survey provided maps and figures on various land use (agriculture, forest, shrub, pasture/grassland and others) with detail information of forest type, size and crown cover, and species dominance of forests.

The second National Forest Inventory (NFI) was carried between 1987 to 1998 to assess the forest resources and forest cover change. The forest coverage and change were updated for all accessible forests excluding Protected Areas using 1991 Landsat TM Satellite images for the Tarai and aerial photographs taken in 1989-1992 for the hills (DFRS, 1999). DFRS also carried out another forest inventory in 2000/2001 focussing on the land cover and distribution of six major forest types and their condition to provide necessary information for preparing district forest management plans (DFRS, 2014).

The third National Forest Inventory was carried out from 2010 to 2012, and is providing data/information on the distribution, extent of species composition, soils and biodiversity, forest cover change information, including timber volume, biomass and carbon stock of Nepal forests by physiographic and development regions. It has also established a national network of permanent forest sample plots for a continuous forest inventory in the future (DFRS, 2014). So far the survey report for two physiographic regions (Tarai and Churia) have been published and the reports for other regions are expected to be published soon.

Apart from above mentioned national level surveys, several surveys and inventories at sub-national and local levels were also conducted. They include: Forest resource assessment and deforestation in 20 districts of Tarai between 1878/79 to 1990/91 carried out by Forest Resources and Survey Division[8] of

[8] Forest Resources and Survey Division was under the Department of Forests until 1993.

the Department of Forests; Forest cover change analysis in 20 Tarai districts from 1990/91-2000/2001) commissioned by the Department of Forests; Upper slope landuse changes between 1978 and 1992 in the High alttude Area of Kabhrepalanchowk and Sindhupalchowk districts commissioned by the Nepal Australian Forestry Project in 1995; Landuse and land cover change analysis in four VDCs of Kanchenjunga Conservation Area (KCA) carried out by Gautam and Watanabe in 2004. Land use and land cover change analysis in nine VDCs and one municipality of Dolkha district and eight VDCs Sindhupalchowk districts carried out by Nepal Swiss Community Forestry Project and HELVETAS Nepal in 2011/12.

2.1.1.3 Land use trends

Availability of accurate and reliable information has always remained a major problem for the analysis of forest cover and land-use change in Nepal. Volumes of literatures do exist discussing on forest cover and land-use change however, the information required for analysis is old, scanty, inconsistent and even frequently contradictory. This makes land use and land cover change analysis extremely complex and difficult. The analysis is further difficult as the data according to physiographic region is much erratic amongst others due to some official documents using five physiographic regions while others using three. This issue is important as the forest types, resource pattern and extent of drivers of deforestation and forest degradation varies across these physiographic regions. The Master Plan for the Forestry Sector (MPFS) 1988 is the only comprehensive official document that provides detailed information on land use and land cover change information by physiographic regions. This document also uses five physiographic regions as adopted by the MPFS and discusses land use and land cover changes over the various periods of time to the extent possible.

2.1.1.4 Land use and land cover change

According to National Forest Inventory (1987-1998), Nepal's 29 percent (around 4.27 million hectares) is covered by forest and additional 10.6 percent (about 1.6 million ha) is under shrubs and degraded forest. The other major land use consist of 3.1 million hectares (21%) of cultivated land, 1.77 million hectares (12%) of grassland, and about 1.0 million hectares (7%) of uncultivated lands, and remaining 3.0 million hectares (20%) is under other land use category consisting of rocks, water bodies, and permanent snow (MFSC/BDSAP 2014). Thus, forests together with shrubland cover 39.6% of total land area of Nepal. The Forest Act 1991 and Forest Regulation (1993) includes waste or uncultivated lands or unregistered lands surrounded by the forest or situated near the adjoining forest as well as paths, ponds, lakes, rivers or streams and riverine lands within the definition of forest area. Therefore, more than fifty percent of the total land area of Nepal falls under the jurisdiction of the forestry sector.

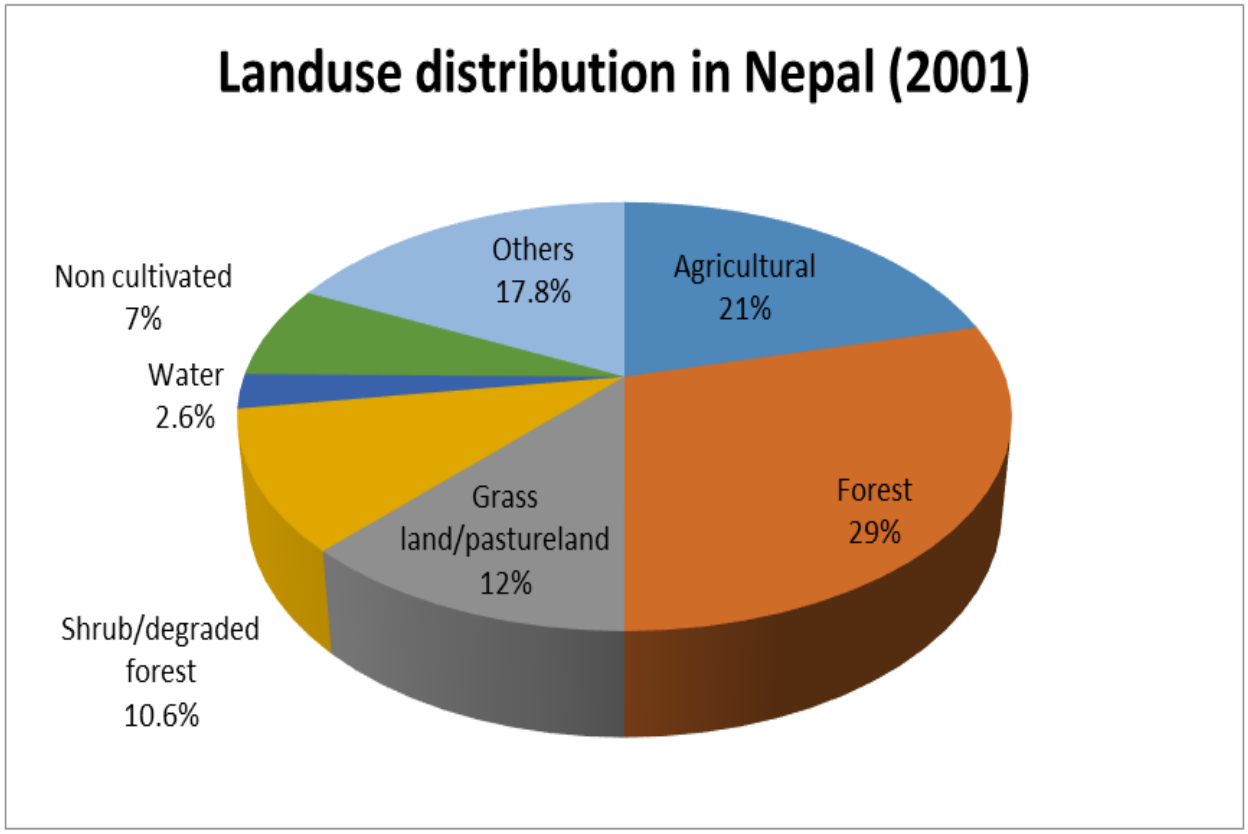

Figure 5. Landuse distribution in Nepal (CBS, 2001)

Table 6. Distribution of natural forests by physiographic and development regions

Regions	Total Area '000' ha	1986 MPFS (1988)				1994 DFRS (1999)			
		Forest '000' ha	Shrubs '000' ha	Forest and shrub total %	% of total forests	Forest '000' ha	Shrubs '000' ha	Forest and shrub total %	% of total forests
High Himal	3350	155	67	7	4				
High Mountain	2960	1639	176	61	29				
Mid Mountain	4442	1811	404	50	36	2900.2	1483.8*	36.2	66.7
Churia/Churia	1886	1438	29	78	24	1319.3	75.4**	74.0	23.5
Tarai	2110	475	30	24	8	545.9***	N/A	N/A	9.4
EDR	2854	923	198	39.3	18.0	736.1	362.6	38.6	18.9
CDR	2734	1063	238	47.6	20.9	918.4	233.8	42.0	19.8
WDR	2935	900	142	35.5	16.7	734.3	256.9	33.7	17.0

Regions	Total Area '000' ha	1986 MPFS (1988)				1994 DFRS (1999)			
		Forest '000' ha	Shrubs '000' ha	Forest and shrub total %	% of total forests	Forest '000' ha	Shrubs '000' ha	Forest and shrub total %	% of total forests
MWDR	4281	1641	76	40.1	27.6	1192.4	442	38.6	28.0
FWDR	1944	991	52	53.7	16.8	687.4	263.9	48.7	16.3
Total	**14748**	**5518**	**706**	**42.2**	**100.0**	**4268.6**	**1559.2**	**39.6**	**100.0**
% Nepal		**37.4**	**4.8**	**42.2**		**29.0**	**10.6**	**39.6**	

Source: MPFS, 1988; FSD/FRSC, 1993; DFRS, 1999

*Note: * The figure is derived from DFRS (1999) data of shrub area deducting the shrub area figure of Bhuju (2010)*

*** According to Bhuju (2010).*

**** Figures are based on FSD/FRSC, 1993, which includes two inner Tarai district of Dang and Chitwan.*

Distribution of natural forests by development and physiographic region is presented in Table 6. The High Mountain and Churia/Churia have significantly large area under forest cover (61% in the High Mountains and 78% in the Churia/Churia) compared to other regions. However, in terms of total percent of forest among the various physiographic regions, the Mid-mountain comprises of the highest percentage of total forest area of Nepal (36%) followed by High mountain (29%), and Churia/Churia, (26%). The Tarai region that inhabits about half of population of the country comprises merely a quarter of land under forests and about 8% of total forest of Nepal, while the share of High Himal devoid of permanent settlement contains 4% of Nepal's forests. Similarly, according to DFRS (1999), the MWDR is the richest region in forests comprising 28% of total forest area of Nepal forests followed by CDR (about 19.8%), EDR (18.9%), WDR (17%) and FWDR (16.3%). Comparing these figures with that of MPFS (1988), forest area in the EDR WDR, MWDR is in increasing trends while in others it is in decreasing trend.

2.1.1.5 Trends of land use and land cover change

Land use and land cover change of Nepal between 1978/79 to 1994[9] is presented in Table 7 and the forest cover status in four time period of 1964, 1978/79, 1985/86 and 1994 is presented in

Table 8. Between 1978/79 and 1994, there is a significant change in the area of forests lands (shrub and forest). During this period area of natural forest has decreased by 24 percent with annual decrease of

[9] The reference year of the National Forest Inventory carried out between 1987-1998 is identified as 1994 calculated as area-weighted mean for the reference years of different methods (DFRS, 1999).

1.6 percent with an area from 5.612 million hectare down to 4.268 million hectare. Similarly the shrubland has increased by 125 percent with an annual increase of 8.4 percent with an area increase from 694 thousand hectares to 1.56 million hectare. However, there is no significant changes in non-forest land uses of cultivated, non-cultivated and grassland. The forest area was increased from 1978/79 to 1985/86, however the loss of forest area was more intense from 1985/86 to 1994 with annual loss of 3.3 percent.

Table 7. Land use and land cover change between 1978/79 to 1985/86 and 1994.

Category	1978/79 (LRMP)		1985/86 (MPFS)		1994** (NFI)		% Change 1978/79-1994		% Change 1985/86-1994	
	Area	%	Area	%	Area	%	Total	Annual	Total	Annual
Cultivated	2,969	20	3,052	21	3,091	21	4	0.3	1.3	0.2
Non-cultivated	987	7	998	7	1,030	7	4	0.3	3.2	0.4
Forests	5,612	38	5818*	37	4,268	29	-24	-1.6	-26.6	-3.3
Shrubland	694	5	706	5	1,560	11	125	8.4	121.0	15.1
Grassland	1,756	12	1,745	12	1,766	12	1	0	1.2	0.2
Water	N/A	N/A	N/A		383	3	N/A	N/A		
Other	2,730	19	2,729	19	2,620	18	-4	-0.3	-4.0	-0.5
Total	**14,748**	**100**	**14,748**		**14,718**	**100**				

Source: MPFS, 1988; DFRS, 1999;

** Includes plantation and enriched plantation areas*

*** The MFSC (2014) has cited the data of categories other than forests and shrubland.*

In 30 years between 1964 and 1994, Nepal lost 2.124 million hectare of forests, which were either converted converted into shrubland or into other land uses (

Table 8). During this period, the area of forest has decreased from 45.5% to 29% loosing 16.5%. The recent inventory result for the entire country is not yet available. However, Forest Resource Assessment by FAO shows an annual loss of 1.39% from 2000 to 2005 and forest area remaining stable during 2005-2010 (FAO, 2010).

Table 8. Forest Cover Status during four different time period

Cover Type	Unit	Years					
		1964 (FSRO)	1978/79 (LRMP)	1985/86 (MPFS)	1994 (NFI)	2000 (FAO)	2005 (FAO)
Forest	Area (000ha)	6402	5616.8	5518.0	4268.0	3900	3636
	Percentage	45.5	38.0	37.4	29.0	26.5	24.7

Cover Type	Unit	Years					
		1964 (FSRO)	**1978/79 (LRMP)**	**1985/86 (MPFS)**	**1994 (NFI)**	**2000 (FAO)**	**2005 (FAO)**
Shrub	Area (000ha)	N/A	689.9	706.0	1560.0	1753	1897
	Percentage		4.7	4.8	10.6	11.9	12.9
Total	Area (000ha)	**6402**	**6306.7**	**6224.0**	**5828.0**	**5653**	**5533**
	Percentage	**45.5**	**42.7**	**42.2**	**39.6**	**38.4**	**37.6**

Source: MPFS, 1988; DFRS, 1999; FAO, 2005; WECS, 2010

2.1.1.6 Rate of forest cover change during different time series

The rate of forest cover change and shrubland change varies during different time series. The highest rate of change in forest area was during 1985/86-1994 (@2.83%/year) and was the lowest during 1978/79-1985/86 (@ 0.22% /year). Similarly, the rate of shrubland increase is also the highest during 1985/86-1994 (@ 15.12%/year) and the lowest during 1978/79-1985/86 (@ 0.3% /year). This indicates that the forest of Nepal is degrading at a very fast rate and majority of them are being converted into shrublands. However, if total area of forests and shrublands is accounted, the overall rate of total area loss is the highest during 1964-1978/79 and the lowest during 1978/79-1985/86.

Table 9. Forest cover change data in different time series (Area in 000 ha)

Period	Forests			Shrublands			Forest and Shrub together		
	+/- '000' ha	% change	% change /year	+/- '000' ha	% change	% change /year	Total change '000' ha	% change	% change /year
1964-1978/79	-786	-12.28	-0.88	0			-786	-12.28	-0.88
1978/79-1985/86	-98	-1.75	-0.22	+17	+2.46	+0.3	-81	-1.28	-0.09
1985/86-1994	-1250	-22.63	-2.83	+854	+120.96	+15.12	-396	-6.36	-0.80
1978/79-1994	-1348	-24	-1.5	+871	+126.41	+7.9	-477	-7.57	-0.47
1994-2005	-632	-14.81	-1.35	+337	+21.6	+1.96	-295	-5.06	-0.56
1994-2000	-368	-8.6	-1.44	+193	+12.37	+2.06	-175	-3.0	-0.5
2000-2005	-264	6.77	-1.35	+144	+8.2	+1.64	-120	-2.12	0.42

Source: After MPFS, 1988; DFRS, 1999, FAO, 2001, FAO, 2006

2.1.1.7 Rate of forest cover change in different physiographic regions

The forest cover change data across the five physiographic region of the country is available only during 1978/79 1978/79 to 1985/86. This is because the forest survey of 1994 did not produce data of five physiographic regions. In betwen 1978/79 and 1985/86, High Himal and High Mountain slightly gained the forest area, whereas whereas Mid Mountain, Churia and Tarai lost (

Table 10). However, specific studies carried out at different time at landscape level shows different trends. The trend of increase in the High Himal and High Mountain was not seen in between 1878/79 and 1994 (

Table 10). A recent study carried out in Chitwan Annapurna Conservation Landscape (CHAL) presents no significant changes in the total areas of forest cover between 1990 and 2010 though variation exists across the physiographic regions (Table 11). The reports shows an increase of forest cover in High Himal, High Mountain, and Churia with an annual increase by about 0.1% per year and decrease in Mid Mountain by about 0.09 % per year in between 1990 to 2010. The decrease in forest area in Mid Mountain is against the popular belief of forest improvement due to the successful implementation of Community Forestry particularly in this physiographic region.

Table 10. Annual deforestation rate in various periods by physiographic regions

Physiographic region	1964-1978/79 (MPFS, 1988)	1978/79-1985/86 (MPFS, 1988)*	1978/79-1994 (NFI)***	1991-2001 (DoF, 2005)	1991-2010 (FRA 2014)
High Himal	N/A	+0.08	-1.9		
High Mountain	N/A	+0.05	-1.4		
Mid Mountains	N/A	-0.08	-2.5		
Churia	-1.1	-0.11	N/A	+0.06**	-0.18
Tarai	-1.8	-3.44	-1.3	-0.27	-0.44
Nepal	-0.4	-0.4	-1.7		

Source: MPFS, 1988; DFRS, 1999; DoF, 2005, DFRS, 2014a; FRA/DFRS, 2014b; Acharya (2004).

** The data set is recalculated from the MPFS (1988:30) figure.*

*** Includes only the hilly areas of Tarai districts but excluding protected areas.*

**** As cited by Acharya (2004) for High Himal, High Mountain and Mid Mountain.*

Table 11. Change in Forest Area by physiographic region between 1990-2010 in CHAL

Physiographic Region	1990	2000	2010	% change			Annual Change (%)		
	Area '000'	Area '000'	Area '000'	1990-2000	2000-2010	1990-2010	1990-2000	2000-2010	1990-2010
High Himal	48.8	50.6	49.8	3.7	-1.6	2.1	0.37	-0.16	0.10
High Mountains	349.4	352.8	357.4	1.0	1.3	2.3	0.10	0.13	0.11

Physiographic Region	1990	2000	2010	% change			Annual Change (%)		
	Area '000'	Area '000'	Area '000'	1990-2000	2000-2010	1990-2010	1990-2000	2000-2010	1990-2010
Midhills	526.3	524.0	516.9	-0.4	-1.4	-1.8	-0.04	-0.14	-0.09
Churia	209.1	210.3	212.6	0.6	1.1	1.7	0.06	0.11	0.08
Total	**1133.6**	**1137.7**	**1136.7**	**0.4**	**-0.1**	**0.3**			

Source: KAFCOL 2013

Tarai and Churia

The deforestation rate in the Tarai has been consistently higher over the past many decades. During 1978/79 to 1978/79 to 1985/86 annual deforestation rate was the highest with annual loss by 3.44%, which is eight and a and a half times higher than the national average of 0.4% /year, and is almost two times higher than the period period of 1964 to 1978/79 (

Table 10). The recent forest Inventory conducted by FRA/DFRS also shows the increasing trend. In between 1991 and 2010, the forest area in the Tarai was decreased by 32,000 ha with annual rate of 0.40%, however the rate from 2001 to 2010 was found higher with annual loss of 0.44% (FRA/DFRS, 2014a).

The Churia region also has continual deforestation over the past several decades. In between 1964-1978/79 it 1978/79 it had a loss of 1.1% per year, which was reduced to 0.11% in the period between 1978/79-1985/86. 1985/86. The recent national inventory has also shown the rise in deforestation by annual loss of 0.18%/year in 0.18%/year in the period between 1995 and 2010 (FRA/DFRS, 2014b), though DoF (2005) shown an increase by increase by 0.06% in between 1991 and 2001 (

Table 10).

Several other site-specific studies have also reported diverse scenario of deforestation and degradation in Churia and Tarai. The Churia in CHAL area is reported to gain forest at an annual rate of 1.7% in between 1990-2010 (KAFCOL, 2013). However, Bhuju (2010) show a significant loss of forest cover and increase in shrubland in Churia in between 1978 and 1994 (Table 12). He reports the loss of forest area by 7.06% with an annual loss of 0.44% and increase in shrubland by 154% with an annual increase of 9.6% in between 1978 and 1994 (Bhuju, 2010). Similarly, the Churia Area Programme Strategy (2008)[10] reports that the forest area in the Siwalik hills and narrow river valleys decreased by 3.1% and cultivated

[10] CAPS has divided Churia area into five distinct landscapes or land units namely Churia hills, Narrow River Valleys, Dun , Bhabar and Tarai.

land increased by 52.3% in between 1975 and 2001. This shows that the forest areas in Churia were cleared and converted to farmlands and the trend is increasing (CAPS 2008).

Table 12. Forest and shrub cover change in Churia between 1978 to 1994

Landuse class	1978	1994	Differences	% of change	
	Area (ha)	Area (ha)	1978-1994	1978-1994	Annual
Forest	1,419,556	1,319,354	-100,202	-7.06	-0.44
Shrubs	29,737	75,402	45,665	153.56	9.60

Source: Bhuju, 2010

Several site-specific studies in Tarai also show increasing trend of forest cover loss. In three VDCs of Ghodajhodi Tal of Kailali district, a decreasing trend in forest cover was found in all VDCs at the sequence of 75%, 70%, 64% for the years 1977, 1990, and 2008, and the loss was the highest in the period in between 1990-1999 (Khanal, 2008). In Laljhadi Forest (15,000 ha) of Kanchanpur district forest cover was shrinking at the annual rate of 4.90% from 1996 to 2002 and at the rate of 3.5% from 2002 to 2010. This loss was compensated by the increase shrub area, which was 1.37% of the study area in 1996, and was increased to 25% in 2002 and to 29% in 2010 (Pandit, 2011). Similarly, in several forest rich VDCs in and around Simara of Bara district, the rate of forest loss was found at 0.72% per year and increase of non-forest land was 0.46% per year in between 1989 to 2005 (Kandel et al, 2010).

Middle Mountains, High Mountains and High Himal

There were little increase in forest cover in High Mountain and High Himal, and a little decrease in Middle Mountain in between the year 1978/79 and 1985/86 (Table 11). However, the loss was more severe in all three regions in between 1978/79 and 1994 of NFI. During this time series, the High Himal lost the forest area by an annual rate of 1.9 %, the High Mountain by 1.4% and Middle Mountain by 2.5%. Several other site-specific studies show mixed results. The Panchase Protected Forest reported to decrease forest area from 76.4 percent in 1990 to 67.4 percent at present with an annual loss of 0.59% (Acharya *et al*, 2014). Similarly, the mixed and broad leaved forests in the High Altitude of 12 VDCs of Kabhre Palanchok district was reported to decrease by 59% and 6% respectively in between the year 1978 and 1992 (Jackson et al 1998). During this time, the grassland in Kabhre Palanchok district was increased by 85% and in Sindhu Palchok it was increased by 214% (Acharya, 2004). In the period between 1985/86 to 2001/02, the area of forest and grass land in High Altitude areas (above 2000 m) were reported to be declined by 18.74 percent and 32.48 percent respectively, and shrubland and

barren land (non-cultivated inclusion) increased by 37.4 percent and 25.7 percent respectively (Baral et al, 2012).

Several other studies have also found increase in forest cover. In CHAL area, there was an increase of forest cover in High Himal and High Mountain region by 2.1 percent and 2.3 percent respectively, however the Middle Mountain lost by 1.8 percent in between 1990 and 2010 (KAFCOL, 2013). The loss of forest cover in Middle Mountain of CHAL area is against the popular belief of forest improvement as a result of successful implementation of Community Forestry. In other areas of Middle Mountain, there are reports of forest improvement. A study of 10 VDCs in Dolakha district analysing Landsat TM imageries of 1990 and 2010 concluded that the rate of conversation of sparse forest into dense forest was found between 1.13 - 3.39 % per year, and the rate of conversion of non-forest area into forest was found between 1.11 - 1.96 % per year (Niraula and Maharjan, 2011)

2.1.2 Efforts to date to address deforestation and forest degradation, and maintain and improve forest land use

A) Evolution of the current forest policy and programs

Forest development of Nepal has evolved from a radical feudalism, conventional command and control, to decentralized and devolved community-based forestry over the last six decades or more. Since the unification of Nepal in 1769 AD, the Shah kings and Rana rulars since 1846 until 1951 adopted the policy of forest landuse conversion to farming as strategy to increase the tax base. A large area of forests was also distributed to rulers'' family members and the supporters as *birta*[11] and *jagir*[12]. The government nationalized the forests and abolished *birta* tenure with promulgation of Forest Nationalization Act in 1957, and Birta Abolition Act in 1959. The Department of Forests was strengthened with the key role of policing the forests and issuing licences to harvest forest products. In order to enforce forest protection measures, stringent legal provisions were made with introduction of Forest Act 1961 and Forest Preservation Act 1967. All these centralized control system alienated people from forests and led to enormous depletion and degradation of forests. A national forestry conference in 1975 paved way to formulate a National Forestry Plan in 1976, which became a basis for the revision of the Forest Act of 1961 in 1978. The revised Forest Act made a provision of people participating in forest management by handing over government forests as Community Forests[13] to be managed by local people.

11 Land grants formerly made by the state to individuals, usually on a tax free and heritable basis.

12 Forests allocated to compensate servants of the state for the period of that service.st reverted to the state.

13 Plantation area handed over to local Panchayat (lowest administrative unit) were termed as Panchayat Forests (PF), and existing government forests handed over them were termed as Panchayat Protected Forests (PPF) until 1990. Both type of forests were than termed 'Community Forests' by the government formed after the democratic movement of 1990.

Global concern on the popularized theory of Himalayan degradation, the debate on the fuelwood crisis and its associated "gap analysis"; and the national and global context of forestry issues led to formulate a Master Plan for Forestry Sector (MPFS) in 1988 (Kanel and Acharya, 2007). The MPFS laid the foundation to implement and institutionalize the community based forestry and the Forest Act (1991) and Forest Regulations (1993) provided the legal framework for the implementation.

The implementation of MPFS with its progressive policy provisions of recognizing forest users rights, untrusting them for protecting and managing forests, changing roles of forestry staff, and retraining of the entire of staff of the Ministry of Forests and Soil Conservation made a paradigm shift in the way forests and biodiversity are protected, managed and utilized. All forestry sector policies, legislations, strategies and programs, at present, are developed over the foundation of MPFS. All these aim to enhance participation of local people including women, Dalits, and indigenous people in planning, decision-making, implementing and benefit sharing. The multi-stakeholder participation and multi-actor engagement in governance and management of national forest is recognized (RPP, 2010).

B) Forest under different arrangements

Out of the total 5.8 million ha of national forests (including shrubland) 4.8 million ha (82.4%) is national forests under the jurisdiction of the Department of Forests and about 1 million ha (17.6%) is under the protected area system under the jurisdiction of the Department of National Parks and Wildlife Reserve. About 49.3 % of national forests remained in the DoF's jurisdiction is under the government managed regime and 33.1% is handed over as community based management regime (that includes community forestry, collaborative forest management, Leasehold forests, religious forests and protected forests; Table 13)

Table 13. Forest area under different arrangement

Category	Sub Category	Unit	Area	% of total forest area
Nepal (National Forest)	**Forests and shrubland**	**'000'ha**	**5830**	**100**
Forests under Protected Areas Systems	National Parks/WRs/HR	'000'ha	452.3	**7.8**
	Conservation Areas	'000'ha	469.8	**8.1**
	NP Buffer Zone (CF only)	'000'ha	101.4	**1.7**
	Forests and shrubland	**'000'ha**	**1023.5**	**17.6**
National Forest under different management regimes	Government-managed forests (Residual National Forests)	'000'ha	**2875.3**	**49.3**
	Community Forests	'000'ha	1700	**29.2**

	Leasehold Forests	'000'ha	42.8	**0.7**
	Religious Forests	'000'ha	0.5	**0.0**
	Collaborative Forests	'000'ha	54.1	**0.9**
	Protection Forests	'000'ha	133.8	**2.3**
	Forests and shrubland	**'000'ha**	**4806.5**	**82.4**

Source: DFRS, 1999; DoF database 2013; DoF, 2014, DNPWC, 2012

C) Efforts to address DD and improved landuse

The government of Nepal has been taking a number of efforts to combat deforestation and forest degradation and manage forest resources. A number of policy and legal instruments, plans and programs are developed and implemented, which are briefly discussed in the following sections.

a) Policy and legal instruments

The Master Plan for the Forestry Sector (MPFS) was one of the most popular policy of Nepal prepared in 1988, which expired in 2011. The Plan emphasized for the promotion of community forestry and community-based forestry. In 1993 the new forest act, and in 1995 the new forest regulation were enacted, which are based on the core concept of the MPFS. This act repealed two forestry acts, the Forest Act, 1961, Forest Conservation (Special Arrangement) Act, 1968, which were more state centered. The MPFS and the forestry act have remained an important milestone for the successful implementation of the community forestry program in the country. After MPFS a lot of policies, thematic strategies, laws, and guidelines have been developed and being developed in the forestry sector (see the list in annex 3). Similarly, the National Park and Wildlife Conservation Act 1973 was amended in 1989 and in 1992 to encourage community participation and engagement in conservation with incorporation of conservation area management and buffer zone management. A number of policies, plans and strategies have been developed to enhance the conservation of biodiversity and ecosystem.

b) Community-based forest management

A considerable progress has been made in Community-based forest management since the implementation of MPFS in 1988. The supportive policy and legal environment, changed political landscape, availability of externally funded project and willingness of government and non-government service providers to innovate and pilot new approaches made a positive contribution in the expansion and institutionalization of community centric approaches of forest management and biodiversity conservation. Community-based forest management make-up a large proportion of accessible forest in Nepal that includes Community, Pro-poor Leasehold, and Collaborative forest and Public Land Management, and Protected Forests. In all these management regimes local communities are the primary beneficiaries from the management of forests.

i) Community Forestry Program

Community forestry program has made a significant progress in Nepal contributing to halt deforestation and forest degradation and even to reverse in many areas, particularly in the Middle Mountains (MFSC, 2013; MFSC, 2014; Gautam, 2006; Niraula et al., 2013). However, pace of improvement in the Tarai is slow as compared to the Hills and Mountains (MFSC, 2013). Currently, as of June 2014, 18,133 Community Forest User Groups have established involving 2.24 million of households are managing 1.7 million hectares of forest (DoF database). The program is widely recognized as one of the successful development initiatives in Nepal and lessons from it have influenced the design and implementation of other development programs in Nepal and also forestry programs in other countries. The program has restored degraded forest and greenery, increased biodiversity, increased supply of forest products, promoted income generation and community development, improved livelihood and empowered women, poor and disadvantaged groups[14].

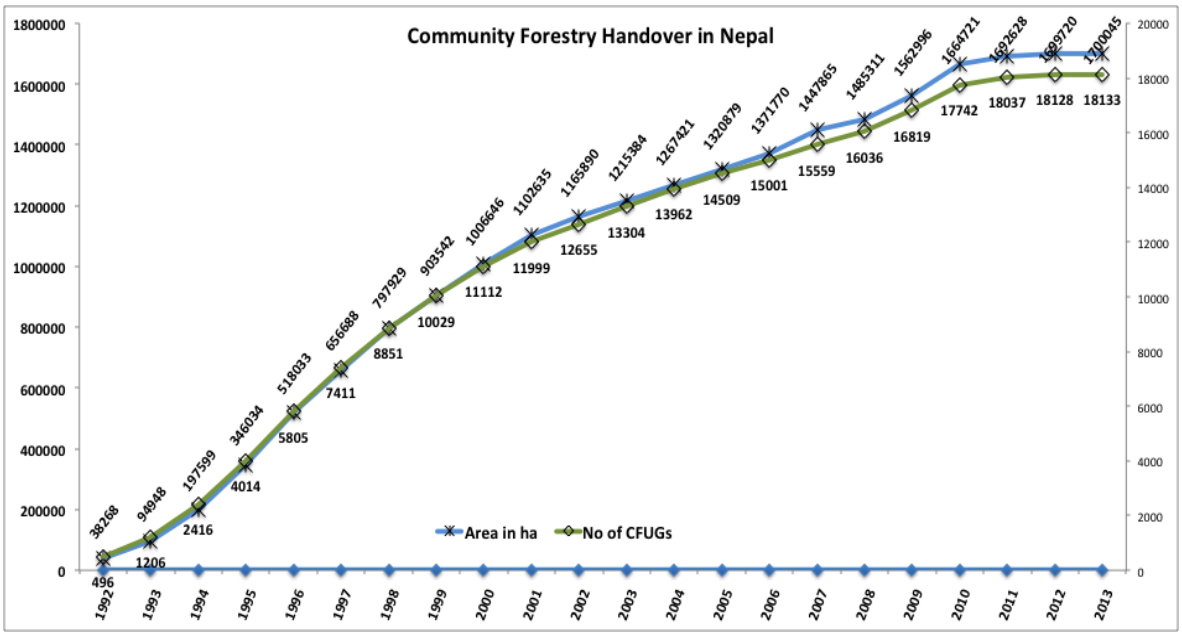

Figure 6. Community Forestry establishment in the last two decades

Despite far-reaching above successes a number of issues and challenges exist. Community forests have been under-utilized, governance issues are seen quite serious, particularly in resource-rich areas and similarly, it has not able to make much impact on the rural employment and the local economy. In addition, a clear policy for the allocation of national forest to the various community-based forest management regimes is lacking-especially for the Tarai and high mountains areas.

[14] According to DoF's website http://dof.gov.np/dof_community_forest_division/community_forestry_dof

ii) Collaborative Forest Management

The government has initiated Collaborative Forest Management (CFM) since 2003 in order to manage the block forests of the Tarai in collaboration with local communities and local governments. A Collaborative Forest Management Directive was made in 2003 under the clause 67 of the Forest Act 1993. As of June 2014, Nineteen Collaborative Forests are established covering a total forest area of 54,072 ha. All these forests are managed as per the approved management plans. And the activities comprises of felling of mature and over-mature trees, retaining of mother tree for seeds, promoting natural regeneration mainly of Sal, construction of fire-lines and forest roads.

iii) Pro-poor Leasehold Forestry Program

The Forest Act of 1993 has made special provisions to lease degraded forest land to groups of households living below the poverty line. As per this provision, the government of Nepal has been implementing Pro-poor leasehold forestry program as one of the priority programs. The program aims to reduce poverty and rehabilitate the degraded forests. The program began as a small pilot project in 1989, which is now extended to 40 districts covering Tarai to High Mountains regions. As of June 2014, a total of 42,835 ha of forest is handed over to 7,419 leasehold forest groups across the country (DoF, 2014)

iv) Protection Forests

The government has taken a new initiative since 2002 to manage some natural forests as protection forests in Tarai, Hills and High mountain areas. So far, eight forests covering a total area of 133,754.8 ha have been declared as protection forests (Table 14). Eight other forests, covering a total area of 223,107 ha are in the process of being declared (MFSC, 2014)

Table 14. Protection Forests in Nepal

Forest	Year Established	Size (ha)	Location	Significance
Kankre Bihar	2002	175.5	Surkhet	Historical; archeological and biodiversity
Madhane	2010	13,761	Gulmi	Biodiversity; eco-tourism
Barandabhar	2011	10,466	Chitwan	Corridor; wetland; habitat for several endangered animal and bird species.
Panchase	2011	5,775.7	Kaski, Parbat, Syangja	Biodiversity; eco-tourism; religious
Laljhadi-Mohana	2011	29,641.7	Kailai, Kanchanpur	Biological corridor; wetland

Forest	Year	Size (ha)	Location	Significance
Basanta	2011	69,001.2	Kailai	Wildlife habitat and corridor
Khata	2011	4503.7	Bardia	Wildlife habitat and corridor
Dhanushadham	2012	430	Dhanusha	Historical; religious; biodiversity

Source; MFSC, 2014

v) Religious Forests

The forest act 1993 has provision of handing over government forest as religious forest. Any forest remained as religious forest on a traditional or since ancient times can be handed over to religious body, group or community and registered as religious forest. In pursuant to this provision, about 5000 ha of forest is handed over to different religious groups across the country.

vi) Public Land Management

The Public land under the jurisdiction of local bodies are now being used for tree cropping mostly in the southern part of the Tarai. Southern parts of Tarai consists of large areas of public barren land, which can be developed into forests or agro-forests. Several of these areas are being planted by handing over to the groups of poorer households. The objective is to involve poorer households who do not have land to plant trees on their private land, increase the supply of forest products.

vii) Conservation of Ecosystems & Genetic Resources

There has been a significant increase in protected areas (PAs) and in-situ conservation of ecosystem and biodiversity in the country. The coverage of PAs has increased from 10,798 km^2 in 1988 to 34,185.52 km^2 at present, representing 23.23 % of the land area of the country with ten national parks, three wildlife reserves, one hunting reserve, six conservation areas and twelve buffer zones. (MPFS, 1988; DNPWC, 2012). A shift in policy from 'people exclusionary' and 'species focused' towards 'people-centered and community based' approaches together with a number of conservation efforts have resulted in the increase in the population of protected animals (Sharma, 2012; MFSC, 2014). Similarly, 11 botanical gardens are established to conserve, educate, and demonstrate a variety of tree species, medicinal plants, climbers, orchids, cactus, and many other plant species.

viii) Landscape approach of conservation

The landscape approach of biodiversity conservation has also been adopted in four landscapes namely, the *Tarai* Arc Landscape, the Sacred Himalayan Landscape, Kailash Sacred landscape and Chitwan-Annapurna Landscape. The aim of the landscape approach is to provide better connectivity to several protected areas and enhance ecological processes and conservation.

ix) Community-based conservations

The concept of buffer zone and conservation area has been extensively practiced as a community based conservation approaches for the conservation of ecosystem and biodiversity across the country. At present, there are 12 buffer zones around nine national parks and three wildlife reserves covering an area of 5,602.67 sq km. The Buffer Zone initiative enhances people's involvement in conservation and also provides conservation benefits to local communities (DNPWC, 2012). In these buffer zone areas 125,475 ha of forests have been handed over as buffer zone community forests to 393 buffer zone CF Groups (DPNWC, 2012). The concept of community-based conservation is practiced in six conservation areas of country: Annapurna, Kanchanjunga, Manaslu, Gaurishankar, Api Nampa and Krishnasar, comprising a total area of 132,500 ha and communities are linked to benefit from protected areas.

x) Conservation of Churia Hills

The *Churia* hills also known as *Siwalik* range in Nepal is a largely forested, geographically fragile and rugged landscape extending from east to west of the country. The Rastrapati Churia Conservation Program is implemented in 26 *Churia* districts. More recently the government of Nepal has declared Rastrapati Churia Tarai Madhes Conservation Program and declared 12.78 % area of 36 *Churia* districts as Environmental Conservation Area to implement integrated environment conservation programs.

xi) Soil Conservation & Watershed Management

The Department of Soil Conservation and Watershed Management (DSCWM) has been established and mandated for the watershed management, soil conservation and integrated management of renewable natural resources. The department was functioning as project modality until 1990. Currently, its services have been extended to 56 priority districts with District Soil Conservation Offices in each district have rehabilitated over 10,000 ha of degraded land, 1,600 gullies and 1000 landslides of various scales and implemented many preventive and supportive measures over the last two decades (FSS team, 2014). However these achievements are insignificant compared to the actual requirements of the soil and watershed conservation services in the country.

xii) Research, survey and inventory

The Department of Forest Research and Survey is engaged to develop and demonstrate appropriate technologies related to forest management, forest growth, suitability of tree species and their nursery and silvicultural technologies. Other areas of research include agroforestry, fodder production, tree improvement, utilization of forest products and preparation of volume and biomass tables for different forest species. The department also generates statistics and information necessary to plan overall forestry development through national forest survey and inventory. Two of the national forest surveys were carried out in 1960s and 1990s, and the third is being conducted since 2010.

xiii) Institutional Development

The forestry sector has had institutional restructuring quite number of times over the last several decades. The MPFS had even identified institutional development as one of the supportive programs. However, the proposed reform by MSFP was over shadowed by the wider administrative reform of the

government such as High Level Administrative Improvement Commission. The MFSC is organized with five departments: Department of Forest (DoF), Department of National Parks and Wildlife Conservation (DNPWC), Department for Forest Research and Survey (DFRS), Department Soil Conservation and Watershed Management (DSCWM), and Department of Plant Resources (DPR), and five regional directorates at regional level. Forestry services at district and local level are provided by 74 District Forest Offices, 56 District Soil Conservation Offices, 7 District Plant Resources Offices, and 10 National Parks, 3 Wildlife reserves and 1 hunting reserve. Recently there have been many changes in Nepal's institutional landscape with increased number of active and vocal civil society, decentralized government at district and VDC levels and expansion of community based organizations demanding governance improvement in terms of efficiency, transparency, rule of law and accountability.

xiv) Human Resource Development

The government forestry institutions are employing about 11,000 staff at different capacity and levels. Many staff including professional foresters are also employed outside government as there is, at present, rise in numbers of civil society organizations and private organization in the forestry sector. Forestry education has also expanded as several different institutions are offering forestry related qualifications from certificate level to PhD. This has resulted in an increase in the level of qualifications held by forestry professionals. A massive reorientation and re-training of forestry staff was emphasized by MPFS for 25 years, with the establishment and institutionalization of training centers at regional level. A comprehensive government-led training programs complemented by non-government and project supported trainings on a wide range of topics have contributed significantly towards attitudinal and capacity shifts in the forest sector. Despite these efforts, capacity of staff, cultural and attitudinal issues, understaffing are still important constraints for forestry sector institutions.

xv) Monitoring and evaluation

In the forestry sector the monitoring and evaluation has not been effective due to a wide information gap, poor record keeping, and weak reporting system. A Concept, Approach and Strategy of M&E in forestry sector was prepared in 2002, however it was not effectively implemented. Currently the Result Based Monitoring and Evaluation (RBME) is emphasized and a M & E plan has been prepared on the basis of guideline provided by the National Planning Commission. The plan includes output indicator, impact and outcome indicator using base line data of July 2012 and target value of July 2015 as per the Three Year Approach Paper (2067/68-69/70) of the National Planning Commission. For the M & E function, MFSC has the Monitoring and Evaluation Division and each department has M & E Sections, however they lack appropriate human and financial resources.

2.1.3 Assessment of land tenure and associated governance issues

2.1.3.1 Assessment of Land Tenure and Resource Rights

Land tenure and forest property rights are critical issues which directly determine who is eligible to receive incentives from REDD+ and related programs. Thus, clear and secure land tenure is required condition to ensure both an efficient REDD+ program and an equitable distribution of benefits (Bruce et al. 2010). Poorly defined land tenure can reduce the incentives for local or national forest protection and facilitate the over-exploitation of forest resources. For this reason, land tenure and forest property rights are the key issues shaping the social and environmental impacts of REDD+ and related programs. Particularly attention to the usage rights of local forest-dependent communities is of fundamental importance. Besides, unclear land tenure is a significant disincentive for investment in all kinds of forestry projects, as it represents a high risk to successful project implementation, and the costs of resolving related conflicts are high.

2.1.3.2 Forest Land Tenure

Land tenure can be defined as the 'bundle of rights' that determine the conditions for access, use, management, exclusion and alienation (the right to sell or transfer ownership rights) of land and resources (Schlager and Ostrom, 1992). In similar vein, forest tenure can be regarded as 'a bundle of rights' over a piece of forest, a tree or a group of trees. The "bundle of rights" includes rights and specific benefits derived from them (access, withdrawal and benefits), management (overall decision-making including rights of exclusion), and alienation (ownership, right to compensation, right to sale). Furthermore, these rights could have been given by law (de jure) or just by practice based on understanding or tradition (de facto)(Bruce, 1989, cited in Acharya et al, 2008). Thus, forest tenure, for the purpose of this report, is defined as authority enforcing claims to a 'bundle of rights', obtainable from forest and its resources. The forest tenure, thus, shapes the definition of who can use which resources, for how long, under what conditions, for whose benefits and on what basis.

Clarity of land tenure and usage rights is vital for REDD+ as it determines who should be compensated for reducing their deforestation (who gets the rewards) and who should be held accountable if deforestation does occur (who holds the risks). If the goal of forest tenure is to enhance communities' control over the forest resources and the benefits therein, as well as delivering sustained forest conservation, then forest management institutions and policies need to cater to the needs and decisions of all key stakeholders, including forest dependent communities, indigenous people, Dalits and women.

2.1.3.3 Assessment of Tenure Modality and associate Governance

Before assessing forest tenure regimes in Nepal, it is better to define 'secure' tenure first. It is difficult to define 'secure tenure', however 'hard' rights that can be defended by law are regarded as more secure than 'soft' rights, such as guidelines or policies that can be withdrawn by the relevant authorities (FAO, 2011). Even where hard rights exist, however, many governments also retain the power of compulsory acquisition, which can enable the state to take control of land for specific purposes, irrespective of pre-existing tenure arrangements. Therefore in order for legal rights to have meaning and be useful, landholders and/or owners must also have equitable access to affordable and fair avenues where they can protect their rights and appeal against decisions or violations.

According to the Forest Act 1993, Nepal's forests are legally categorized as either national or private, with ownership and control under the state and individual owners respectively. The state owned national forest as per the Forest Act 1993 includes all forests other than private forest, regardless of the

demarcation of their boundaries and including cultivated or uncultivated land, roads, ponds, lakes, rivers, streams and the shingly land that is surrounded by or in the vicinity of a forest. Under state-owned national forests there are various management regimes such as community-based forests, which includes collaborative, leasehold, religious, and community forests; and state-managed forests, which include government-managed national forest, protected forest areas and conservation area. The private forests are the planted or protected forests on land that belongs to an individual as per the Land Act 1964 but are regulated by the Department of Forests as per Forest Act 1993.[15]

Thus, it is evident that the Government of Nepal (GoN) has the land-ownership of all forests (Section 67 of the Forest Act, 1993) including community forests, leasehold forests and religious forests which are provided to communities or people for the conservation, management and sustainable use of forest and its products. The Forest Act, 1993 which ostensibly support forest user groups and their autonomy is considered as the prime factor of proliferation of the CFUGs throughout the country with strong evidence of ecological restoration in many community-managed forests including an expansion in social capacity through regular decision-making and management activities and investments in local development such as potable water, trail and road improvements, and rural electrification (Pandit et al., 2011).

Despite these statutory backings (of hard rights) which resulted many community benefits, CFUGs still face significant threats to their rights to manage and use their forest resources. Primary among these threats is a perpetual lack of secure tenure over the land that their forests stand on. In fact, CFUGs have access, withdrawal, and management rights over their forests, but they do not have rights over the sale of the total stock of forests and the land on which the biomass stand. Still the government's modus operandi regarding the management and utilization of forest products have significant impacts on community forestry. It is argued particularly by government forestry officials that CFUGs have only use rights to forest resources and not to land (as state is the owner). Furthermore, it is also considered that rights to carbon are vested on ownership and thus, the below-ground carbon in Community Forests would belong to the State. This might be problematic in the context of carbon trading, since carbon is contained not only in trees, but also in the soil, roots and organic debris, of which the rights-holders remain ambiguous (Bastakoti & Davidsen, 2014). Since REDD+ makes no distinction between below-ground (soil) and above-ground (tree) carbon, the government could legally claim all revenues from carbon financing that result from soil carbon, unless those rights are formally transferred to CFUGs or other community groups.

[15] It makes a provision for registering a private forest with the District Forest Office (DFO) to avail of government support and incentives. On the contrary, restrictions are imposed, viz. the Gazette notification of December 31, 2001; the government banned harvest, transport and export of six timber species (*Chanp (Michelia champaka m. kisopa), Khair(Acacia catechu), Sal (Shorea robusta), Simal(Bombax ceiba), Satisal (Dalberia latifolia)* and *Vijaya sal (Pterocarpus marsupium.* Ban on felling of *Sal* and *Simal* in private land lifted in late 2007.) for commercial purposes. Furthermore, it banned the collection, sale, transportation and export of two NTFPs, viz. *Panchaule (Dactylorhiza hatagiera)* and *Okhar* (*Juglans regia*). Similarly, eight other species are prohibited for export in unprocessed form without permission of the Department of Forest (DoF). It can be argued that the act is not fully favorable for private forestry because it still retains some of the legacy of the Private Forest Nationalization Act 1957 (Acharya and et.al., 2008)

In addition, there are equally pressing issues of intra-community equity in benefit-sharing in community based forest management modalities. Since Nepali society is highly differentiated and hierarchically structured along the lines of economic status, gender, caste and ethnicity, internal inequities in access to benefits and decision making persist within many CFUGs. Usually, upper-caste men from wealthier families dominate the FUGs and influence decisions that usually end up in unfair benefits flowing to a few elite families. Consequently, there are persistent problems of elite capture in decision making and benefit-sharing even in community based forestry including CF (Anderson, 2011; Thoms 2008). In order to avoid the trend of elite control of the forest users mechanism, the rules need to be revised to make mandatory for all User Group Committees to include at least fifty percent representation of dalits, adivasi /janajati peoples and 'below poverty line' community members. The same percent should be applied in trainings, sensitization, workshops and other activities at all levels of meetings, discussions and interaction. (SESA, 2014)

Furthermore, the rights guaranteed by law have been continually challenged by the government footing on the same act, attempting[16] to amend the act and issuing guidelines. For example, the Section 68 of the Forest Act, 1993 empowers the GoN to provide parts of government-managed forests, protected forests, community forests, leasehold forests or religious forests for the implementation of national priority project(s), if there is no alternative other than forest area for project implementation and if it does not adversely affect the environment significantly. The national priority could be determined by the National Planning Commission or the Council of Ministers but alternative to forest and significant adverse impacts on the environment could be determined and/or analyzed and evaluated using the IEE or EIA tool. Likewise the Rule 12 of the Forest Rules, 1995 also empowers the GoN to prohibit (ban), by publishing the notice in the Nepal Gazettee, the collection, utilization, sale and transportation of designated forest products.

The above discussions clearly indicate that despite rights have been clarified on paper (Act), the actual transition of *de facto* control of forest land has been very slow, and many attempts[17] have been made in such a way that centralized government agencies have maintained discretionary control, leaving local tenure insecure, which required an urgent need of amendment on all relevant acts particularly on Forest Act 1993 to accommodate the present REDD+ strategy.

Similarly Nepal's forest governance appears poor and is characterized by a lack of efficient implementation and enforcement of regulations, overlapping and inconsistent legal frameworks, and a level of corruption.[18] The ongoing political transition and associated uncertainty have hampered the law enforcement. As a result large chunk of forest area has been used by the army, security forces, People's Liberation Army (Maoist), handed over to development projects such as road building and electricity

[16] Call by the MFSC to ban the harvesting of all green trees during 2011

[17] In 2010, the Government of Nepal drafted a bill to amend the 1993 Forest Act to return some of the powers given to the communities back to the government. Proposed changes include expanding the role of the forestry department in CFUG forest planning, harvesting, and marketing activities; requiring CFUGs to contribute 50 percent of their forest revenues to the national treasury; and restrictions on tree-felling (Sunam et al., 2010). After facing strong resistance from FECOFUN and other civil society organizations in early 2011, the amendment is presently on hold.

[18] Findings of stakeholders consultation

installation or encroached by encroachers. Since forest lands are largely owned by the state and therefore are targeted for public infrastructure such as roads, canals, hospitals and schools and targeted by landless poor people (sukumbasi) and other ill intended encroachers. Thus, reform of the laws and policies surrounding forest land tenure is essential to ensure that REDD+ projects that will have both reduce emissions from deforestation and degradation, and positively impact the livelihoods of forest communities by maximizing the flow of REDD+ benefits to these groups.

The Targeted Support (TS) agreed in June 2014 between UN-REDD and the GoN will include an in-depth review of Policies, Legislation and Regulation (PLR) which will lead to an improved national legislative framework.

2.1.4 Assessment of natural resource rights and the associated governance issues

2.1.4.1 Natural Resource Rights and Associated Governance Issues

In Nepal, forest use rights of citizens have historically been recognized both legally and customarily. However, before forest nationalization, only *mukiyas* and *jimuwals* exercised forest control rights as state functionaries. The forest tenure reforms in the 1980s attempted to reverse this trend through participatory forest governance that sought to reconnect forest communities with local user rights, stewardship responsibilities, and the long-term benefits of sustainable forest use. The Master Plan for the Forestry Sector (MPFS), approved in 1989, particularly marked a new era when it officially prioritized the devolution of key forest tenure rights to local communities, as long as these were willing and able to manage them. The Forest Act (1993) established different forest tenure categories and management arrangements between the state and the forest users.

Despite these positive efforts, the land tenure of all the existing forest management modalities officially rests with the government except for private forests, whereas forest use right and product benefit-sharing varies amongst the different management modalities (Table 15). The executive committees of different community based forestry regimes also exercise control rights to a certain extent, transfer rights have often remained exclusively with the government. However, the *de-jure* forest control rights holders (the forest departments) are frequently criticized for transferring the forest lands for other uses including settlements, infrastructure development, educational enterprises, high tension lines, irrigation canals, and hydropower plants, indiscriminately, and against the prevailing forest policy. It is also often blamed that the governments fail to exercise their control rights to arrest deforestation and forest degradation due to a variety of reasons, including lack of resources and capacity[19]. Besides, there are many instances of conflicting sectoral policies that have created conflicting claims over forest products and land use and control rights, eventually resulting in failure of governance. For example, there is some overlapping of right on natural resources between Forest Act 1993 and Local Self-Governance Act 1999. The overlapping of rights on resources means that local political units under the Local Self-Governance Act 1999 can overrule the management plan and decisions of CFUGs. These local political units have also been given rights over all natural resources within their jurisdiction and they can also charge taxes.

The table also shows that the duration of resource use (forest tenure) is silent, except in leasehold management. The undefined tenure period has contributed to uncertainty about people's rights and

[19] Findings of Consultations

insecurity over forest resources. Therefore, local communities are trying to ensure their title, customary rights, marketing opportunities, right to agreement, compensation, etc., in the legally valid documents such as certificate, operational plan and constitution.

The mechanism of benefit-sharing among the various right holders as illustrated in Table 15 shows that private forest products are discriminated against compared to other products (e.g. VAT is not applicable for agriculture products) from the same piece of land. The table also indicates that collective management such as CF is enjoying greater benefits compared to other forms of management. Even in private land, the poor and marginalized people are reluctant to plant trees on the land they cultivate as tenants because in this tenurial form they lack security over the trees.

2.1.4.2 The Issues of Customary Rights

The indigenous traditional customary practices relating to land and forest are still alive in the remote areas like Dolpo, Manang and Mustang in the western mountain region of Nepal, where the access of the Government of Nepal in implementing the rules and regulation of land and forest is weak. In fact these customary systems have evolved taking into consideration both conservation of resources and people's livelihood from time immemorial in Nepal. However, the forest management regimes listed in Table 15 has not explicitly recognized the customary forest usages. Many Indigenous Peoples (IP) representatives complained during consultation meetings that after promulgation of land Act 1964 and Forest Act 1993 customary rights have been categorically denied. IPs in Nepal particularly claimed that these acts did not recognize any basis for the customary system of management of resources, though Nepal has ratified numbers of international treaties (ILo 169, UNDRIP, 2007) which guarantee categorically customary rights of IPs.

Although one of the preambles of the Forest Act (1993) and Forest Regulations (1995) was on the social and economic development along with environmental conservation and fulfillment of the basic needs, the recognition of traditional collective forest and land management has not been the priority in the management regime of the forest regulation. The customary systems are considered better in terms of reducing the vulnerability of individuals. There is a social network and safety-net in traditional systems that look after the people suffering from contingencies and the like (Acharya et al, 2008).

However, Community Forest Guidelines (2008) have some flavors to respect customary rights and indigenous knowledge in forest management. The guidelines speak of the protection of customary practices and traditional knowledge but its implementation is hardly seen on the ground. The provisions envisioned in the guidelines -- empowerment of women, and inclusion in leadership and grass root democracy, representation of indigenous peoples and indigenous women in the decision making level— are yet to be implemented meaningfully. Similarly, lobbying and advocacy for the recognition of traditional customary practices of land and forest management is yet to be recognized by the guidelines and policies of the Community Forestry Users Groups (CFUGs) and their national and local level networks including FECOFUN (NEFIN, 2014).

Table 15. Tenure arrangements, bundle of rights and right holders in different forest management system in Nepal

Management System	Type of Forestry	Bundle of Rights	Right Holders			
			State/government	Community/User Group	Households/Individual	IPs and other forest dependent peoples
Collective Management	Community Forest (CF)	Access & benefit (Use Right)	Approve Operational Plan (OP) & handover. Tenure period guaranteeing access (but not ownership) not defined by law, normally for 5-10 years with extension.	Entry through user membership, (some has started to issue entry fee nowadays). 100% benefits to community. Access to forest resources. Recognizes traditional use rights and access.	Membership entails access to forest products and other benefits. Compliance with associated responsibilities required.	No explicit legal recognition and specific provisions for IPs and other groups
		Management (Control Right)	Approval of OP, allowable cut, sets targets for expenses in particular fields, pose taxes, monitoring.	Rights to make management rules and revise management plans. Executive Committee (EC) and hamlet committees guide decisions for CFUG related to protection, plantation, silvicultural practices, benefit-sharing, fund management, and monitoring/evaluation.	Representation in decision-making bodies. Participation in tole meetings, general assembly, monitoring/evaluation committees	CF guideline (2008) speaks for protection of customary practices and traditional knowledge
		Alienation (Transfer	Revoke rights, can change land use (Giri,	x	x	x

		Right)	2012).			
	Leasehold Forest (LF)	Access & benefit (Use Right)	Lease forests for a period of 40 years extendable to 40 years. System of inheritance not defined.	Access to group through membership. 100% benefits to community. Access to forest resources. Involves poor households only.	Membership entails access to individual forest plots for households. Compliance with associated responsibilities is required.	IPs and other groups are not explicitly recognized
		Management (Control Right)	Approves operational plan. Restricts forest type and tree use.	Operational plan provides the basis for forest protection, management, access and distribution of products among the leasehold group members.	Representation in planning, livelihood improvement activities, monitoring, decision-making etc. Benefits to individual households.	IPs and other groups are not explicitly recognized
		Alienation (Transfer Right)	Revoke rights, can change land use(Giri, 2012).	x	Right to transfer or sell their rights to others after successfully completed one-third of the lease period.	x
	Collaborative Forest	Access & benefit (Use Right)	Tenure is unlimited, 50 % benefits from the forest go to state.	The communities are granted access and withdrawal rights. Local government and communities get 50% of the income from the sale of firewood and timber.	Little space for individual and household members to determine benefit sharing modality	IPs and other groups are not explicitly recognized
		Management (Control Right)	Approve management plan and it is managed through an annual scheme or 5-year plan	Involvement of both nearby and distant forest users, and is coordinated through a District Forest Coordination Committee dominated by the	Individual and household members involved in planning but they have little voice in how CFM areas are to be managed	IPs and other groups are not explicitly recognized

				local forestry department.		
		Alienation (Transfer Right)	Revoke rights, can change land use	x	x	x
	Religious Forest	Access & benefit (Use Right)	Tenure is unlimited. Sale of forest products for commercial purpose is restricted	100 % benefits go to local religious group for only religious purpose	There is no specified rights for individual/households	IPs and other groups are not explicitly recognized
		Management (Control Right)	Management is defined usually through an annual scheme or 5-year plan	Management plan prescribes protection and management responsibilities	There is no rights for individual/households	IPs and other groups are not explicitly recognized
		Alienation (Transfer Right)	Revoke rights, can change land use	x	x	x
	Buffer zone (BZ) CF	Access & benefit (Use Right)	Tenure is unlimited but government approve Management plan and get 50-70% benefits	Allocate 30-50 percent revenue generated from protected areas to local communities for community development	Membership entails access to forest products and other benefits. Compliance with associated responsibilities required.	IPs and other groups are not explicitly recognized
		Management (Control Right)	Management is defined usually through an annual scheme or 5-year plan	CF is required to work based on the management plan of the buffer zone approved by government CF has no authority to sell timber to outsiders	There is little space for meaningful participation of local communities - the direct stakeholders- in preparation of management plans of national parks as well as buffer zones	IPs and other groups are not explicitly recognized
		Alienation (Transfer	Revoke rights, can change land use	x	X	x

		Right)				
	Conservation Area	Access & benefit (Use Right)	Tenure is unlimited but government approve Management plan	Entry through membership.	Membership entails access to forest products and other benefits	IPs and other groups are not explicitly recognized
		Management (Control Right)	Management is defined usually through an annual scheme or 5-year plan	CF is required to work based on the management plan approved by government CF has no authority to sell timber to outsiders	There is little space for meaningful participation of local communities	IPs and other groups are not explicitly recognized
		Alienation (Transfer Right)	Revoke rights, can change land use	x	x	x
State Management	Government forest; Protected forest and National Parks and Wildlife reserves	Access & benefit (Use Right)	Tenure is unlimited. All benefits go to the state.	GMF: Only licensee would have rights to get access pursuant to forest rules; Free access for religious purpose. Protected forests: Only licensee would have rights to get access; National Parks/WR: Access restricted but can be opened for grasses.	Limited or non-recognition of people's rights over forest. Access to collect grasses, dead branches and certain NTFPs household consumption or commercial use, for example Yarsagumba but access dependent upon the decisions of forest authority	IPs and other groups are not explicitly recognized
		Management (Control Right)	Management is defined usually through an annual scheme or 5-year plan and protected through guards (army and	GFM/NP/WR: No direct engagement. Protected forests: Protected Forest Counsel is made but the management right is not yet defined.	No specific role in GFM/NP/WR; Limited role in the protected forests.	IPs and other groups are not explicitly recognized

			armed policy).			
		Alienation (Transfer Right)	Full ownership	x	X	
Private Management	Private forest (registered or nonregistered	Access & benefit (Use Right)	Provide written permission to sell forest products in the market		Tenure is not fixed (dependent on owner's wish). All the benefits go to individual owner	IPs and other groups are not explicitly recognized
		Management (Control Right)	Restriction on growing certain species and also imposed VAT unlike on agricultural products grown on private lands and necessary to pay land revenue		Owner is solely responsible	IPs and other groups are not explicitly recognized
		Alienation (Transfer Right)	x	x	Full ownership	

Source, Bastakoti & Davidsen, 2014; Giri, 2012 & Acharya et al, 2008

2.1.4.3 The Issues of Carbon Rights

Among the different forest management modalities presented in Table 15 only communities or user groups in Community Forest (CF) enjoy management and use rights and successful to receive array of benefits compared with other management modalities. Users in CF are entitled to receive all forest products (both timber and non-timber) from forests handed over to them. The Forest Act (1993) defines forest products as 'all the products available in the forests including timber, leaf, branches, stone, sand, soil, minerals, wild animals and water'. This definition excludes the forest carbon as forest product and there is no single legal reference for clarifying carbon ownership, and thus this remains unclear. As discussed already above, the forest carbon exists both within plants and within the soil; thus ownership rights to forest carbon could prove hard to define in community forests where rights to ownership of the forest and the underlying land are separated. Carbon could be treated as a 'forest product (or service), in which case existing benefit-sharing mechanisms based on currently prevailing practices would apply (at least for above-ground carbon) but the rights to belowground carbon stores found in the soil still remain with the government for now (RPP Nepal, 2010). This needs a resolution for future benefit sharing of benefits.

The concept of "carbon rights" in Nepal is relatively new and poorly understood. It is open to multiple interpretations. Delineation of carbon rights is key issue for effective REDD+ implementation and carbon trading. It is particularly important for Nepal where communities' customary rights to use and manage forest resources are not presently recognized or protected under the law. The existing tenure regimes have no clear provisions to answer who has the right to benefit from carbon stored in the landscape where the state owns all the forest land, but communities and groups have statutory (in some cases customary as well) tenure over the forests. It is observed that there is some apparent overlap of government's policies and acts over forest resources, for example in terms of property rights of forest land and authorities of government officials over the local peoples' usufruct rights. The Forest Act 1993 guarantees non-interference from the government forest office in operation of the community forestry user group (CFUG), and the management of the community forest as long as the CFUG complies with Forest Act and the Regulation and follows the CFUG's operational plan (MFSC, 2000). However, there is a need of amendment to include the REDD+ carbon credits and their ownerships as the existing plan gives the usufruct rights of CF products for five or ten years.

While the government should receive some benefits from carbon trading, if it monopolizes carbon rights there is significant risk that communities will not gain adequate financial rewards and incentives for community members and external investors to support conservation efforts. A key principle is that carbon rights should be linked to land and forest tenure rights to minimize complexities and there will be a less direct link between forest management responsibility and the potential benefits from carbon trading. However, given the absence of secure community land tenure, there is no legal precedence for communities to obtain carbon rights. For example, carbon rights are less clear in the context of CFM. CMF in Nepal is based primarily on a forest policy promulgated by the MFSC in 2000. It is not well defined legal or regulatory entity governed by legislation, like CFUG under Forest Act 1993. This means that issues of ownership and tenure rights for all types of forest management need to be resolved before implementing REDD+ strategy. Thus, carbon rights must be integrated into basic resource and land rights, including customary rights, which in turn must be clarified, strengthened and effectively enforced. In addition, carbon rights must be harmonized with existing laws governing all form of natural resources right.

2.1.4.4 Benefit Sharing: Principles and Approaches

Benefit sharing, often referred to as the transfer of incentives in the form of direct and indirect financial and other benefits, is one of the key ingredients of a successful REDD+ regime. Such incentives, in turn, contribute to the enhancement of governance, securing tenure rights, improving environmental services, and raising income from REDD+ related activities. Therefore, the design of a system or mechanism that ensures equitable benefit sharing is vital for making REDD+ successful toward its mission of lasting net emissions reductions, realization of benefits to forest communities, and improved livelihoods of vulnerable and poor people. The likely additional cost to be emanating, for instance, from restriction of access to land and resources and improvement in policy and governance system as a part of REDD+ process and enforcement, also implies the

need for higher net benefits and more equitable sharing of the benefits to make REDD+ acceptable, effective and sustainable.

Generally, there are three approaches that are regarded to be relevant in the REDD+ context. These are performance, participatory management and sharing of concession revenues based. Payment for environmental services is a benefit sharing model that is regarded to be suitable in applying performance-based payments under REDD+. This approach requires schemes that address the issues of equity, exclusivity, and conditionality. Equity includes fair benefit sharing with and within the poorest communities and avoidance of elite capture of the benefits. Exclusivity requires addressing issues related to national land governance regimes. Conditionality is linked to benefits with performance which again needs tailoring to local realities, including the timing and frequency with which payments are made. Participatory forest management is the most promising potential model for decentralized management of forest resources. Such an approach allows inclusion of small landholders for delivering REDD+ objectives. In this approach, the risk of deforestation due to increased market access and elite captured practices are often regarded to be some constraining factors. Concession benefits, on the other hand, needs sharing equitably among affected parties.

In Nepal benefit sharing is most common and popular in community forestry and buffer zone forestry with varied practices and results due to differences in governance and management regimes. The buffer zone development program indicates that biodiversity conservation and community development can go together with the participation of local communities. Under this scheme, about 30 to 50 percent of the generated revenue is used for well-being of communities and forest users and the rest is spent in protected area conservation. In the community managed forestry, community groups determine the rate or prices of all forest products and sale their products following set rules. Of the total income, the users group has to allocate 35 percent for poverty reduction and 25 percent for forest conservation. In case of some timbers like sal and khair, groups are obliged to pay 15 percent total income to the government.

Based on many country experiences including those in Nepal, all three approaches viz performance, participatory and concession based depending on the alternative forest regimes could be appropriate. The pilot projects implemented in three districts through carbon funds indicate that the performance based funding from the centre could be equally useful from the point of view of forest conservation and uses including benefits sharing more equitably. Depending upon the cases, the concession approach could also be followed. More importantly, a multi-stakeholders approach must be followed at central, sub-national and local community level as a benefit sharing and fund mobilization mechanism for ensuring that it helps to enhance sustainable forest conservation and improved forest governance. Experiences also indicate the need for improved organizational structures through adequate representation of poor and marginalized communities in decision making and benefit sharing. At the same time, review of mandates and responsibilities of each stakeholder will also be required to avoid possibly conflicts. Another important factor to be considered is that an effective monitoring and evaluation system becomes an integral part of any benefit sharing mechanism at any levels to ensure that benefits reach the appropriate and functional stakeholders and right holders. Based on such considerations, robust benefit sharing principles must be linked with alternative forest management regimes appropriate to the Nepalese context.

2.1.4.5 Forest Use Right and Gender Equity

Gender equity in relation to forest tenure can be measured by the existence of gender-equity mechanisms, their use in practice, and gender equity impacts of forest tenure and rights on conservation and livelihoods. While community and leasehold forests apply different approaches to gender mainstreaming, there is no mechanism for government-managed forests. In both community and leasehold forestry, women are mandated to hold at least one-third of forest committee positions. Likewise, the 1993 Forest Act identifies women as ‘primary users’ of forest and outlines their dependence on forest and underpinning their rights in forestry programs. However, the act and related policy documents neither adequately appreciate women’s contribution in forestry nor identify them as agents of change. In addition, an institutional weakness within the CFUG could deprive women and other marginalized section of communities of the opportunity to benefit from forests. The guidelines for community forestry state that women should comprise 50 percent of the

CFUG committee but this often does not occur. If women are present in the CFUG committee, they are not able to influence decision making processes due to many socioeconomic constraints including patriarchic characteristics of Nepali society.

Compared to government-management forestry, the community and leasehold forestry regime indicates that secure tenure rights to communities are essential to meet the multifaceted objectives of conservation, and livelihoods. Additionally, if the tenure rights consider gender as an integral part and prescribe specific guidelines of mainstreaming, gender equity can be consolidated. For tenure to be considered an important means to achieve social justice, it needs to explicitly address unequal gender and power relations. In doing so, it has to expand the current focus of ensuring women's access to and benefits over forest resources through legislative frameworks. For law and policy to influence gender relations in forest tenure, a more nuanced framework is required to deconstruct, reconstruct, and re-conceptualized authority in both the rules and the laws that govern use and benefits, as well as the institutions that make and enforce such rules and laws (Giri, 2012).

2.1.4.6 Statutory Conflict and Contradiction on Forest Tenure Right

In Nepal several laws and regulations have conflicting provisions and authority over the use of forest and control the forest area. Laws governing land, forest and mining all contain substantial areas of overlap that cast serious uncertainty over entitlements to receive benefits including REDD+ benefits. There are overlaps of activities/rights in Forest Act 1993 and Local Self Governance Act (LSGA) 1998, which sometimes invite conflict in forest resource management and use. The LSGA has specified the rights of use of forest resources and their duties to protect the environment and forest to the local bodies e.g. VDCs, Municipalities and DDCs in their respective areas, which are inconsistent and conflicting with the community forest provisions of the Forest Act 1993.The most prominent being the use of stones, sands and gravels within and outside the forest areas. The local bodies as per LSGA want to use the stones, sands and gravels for their development purposes whereas Forest Act prohibits extraction of stone, sand and land under the forests which have to be used or conserved as per the Forest Act of 1993. The perceived duel ownership of these products by the DDC and DFO (as per the Forest Act) has created ownership, management, utilization and monitoring problems of forest areas which have plenty of stones, gravels and sand.

Similarly, Nepal Mines Act 1966, Mines and Minerals Act 1985 which give the authority of extracting and licensing of minerals underneath the land including forest to the Department of Mines and Geology. The operation of mining and extraction of minerals in any forest lands is strictly prohibited in Forest Act. The Public Roads Act, 1974 gives the Department of Roads (DoR) an authority to build roads in the forests. The act also provides the department an authority to excavate and utilize the soil, stone or sand lying nearby roads for construction and maintenance of roads. These rights and authorities conflict with the provisions of the Forest Act. Likewise Water Resources Act, 1992 empowers the state to use water without affecting the environment. However, the forest act defines forest products as anything including water that lies within the jurisdiction of forest area. This conflict in jurisdiction and authority between the Ministry of Water Resources, and the Ministry of Forests and Soil Conservation has affected the conservation of forest.

These contradictions, conflicts and overlapping claims indicate a lack of coherence between forest acts and other pieces of legislation affecting forests negatively. Such conflicting claims on ownership, use and protection of forest have directly or indirectly accelerated the depletion of forests in Nepal. For example, there is massive program of village road construction in all parts of the country, and all forests that are alienated for road surveying are subject to clear felling. Numbers of hydropower projects licensed under Water Resource and Electricity Acts are being constructed in forest lands clearing significant forest areas.

2.2 Assessment of Land Use Change Drivers

Many human activities and processes exert pressure on the forest leading to deforestation and/or forest degradation (DD). The 'deforestation' and 'forest degradation' are two distinctly different phenomena.

Deforestation refers to the conversion of forest land to another land use or the long-term reduction of tree canopy cover below the 10% threshold through a continued human-induced or natural perturbation, whereas forest degradation is the changes within the forest which negatively affect the structure or function of the stand or site, and thereby lower the capacity to supply products and/or services (FAO, 2001). However, the drivers of DD are diverse, complex and interconnected, so all studies carried out during REDD+ preparation have dealt and analysed together (WWF/TAL, 2003; ANSAB, 2010; PSPL/FECOFUN, 2010; MFSC, 2010; WWF Nepal/ Hariyo Ban Program, 2012; Baral, et al, 2012; WWF Nepal/ Hariyo Ban Program, 2013; UN-REDD/REDD Cell, 2014; MFSC (2014)). The REDD Readiness Preparation Proposal (RPP) of Nepal has identified nine major drivers as high dependency on forest and forest products (timber, firewood and other NTFPs), illegal harvest of forest products, unsustainable harvesting practices, forest fire, encroachment, overgrazing, infrastructure development, resettlement, and expansion of invasive species. Several other studies have identified a set of drivers (see Annex 3). Some of these drivers are common across the physiographic regions, however some are varied due to the diverse socio-economic condition of people, bio-physical conditions and ecological characteristics of the different physiographic regions. Through a synthesis and analysis of all the drivers identified by these studies; and verification and prioritization through stakeholder consultations in a number districts, regional and local level workshops a total of 9 direct drivers and 10 underlying causes are identified. Direct drivers are human activities originated from human choice of land use and livelihood options, which directly impacts upon forest cover (Ojima et al, 1994; Turner et al, 1994; WWF Nepal/ Hariyo Ban Program, 2012), and underlying causes are structural in nature, which are complex of social, political, economic, technological and cultural variables (Geist and Lambin, 2002; WWF Nepal/ Hariyo Ban Program, 2012)

Identified nine drivers are: (i) Forest fire; (ii) Over grazing/uncontrolled grazing; (iii) Unsustainable utilization of forest products (unregulated, illegal, poor technology)/Unsustainable harvesting; (iv) Weak Forest Management practices (unmanaged/under-managed); (v) Unplanned infrastructure development (includes manmade disasters); (vi) Urbanization and resettlement; (vii) Encroachment; (vii) Expansion of invasive species; (ix) Mining /excavation (sand, boulders, stones). Priority of these drivers according to the magnitude of effect varies in different physiographic regions. Table 16 presents these drivers, drivers for and affecting regions. (Annex 3)

Table 16. Direct drivers, their underlying causes, nature and area

SN	Drivers	Drivers for	Affecting regions
10.	Forest fire	Forest degradation	HM (1)*; MH (3); S (1);T (2)
11.	Over grazing/uncontrolled grazing	Forest degradation	HM (1)*; MH (4); S (1); T (1)
12.	Unsustainable utilization of forest products (unregulated, illegal, poor technology)/Unsustainable harvesting	Forest degradation	HM (2); MH (3); S (1); T (1)
13.	Weak Forest Management practices (unmanaged/under-managed)	Forest degradation	HM (1); MH (3); S (1); T (1)
14.	Unplanned infrastructure development (includes manmade disasters)	Deforestation	HM (2); MH (1); S (2) T (4)

15.	Urbanization and resettlement	Deforestation	HM (5); MH (5); S (1) T (1)
16.	Encroachment	Deforestation	HM (5); MH (5); S (1); T (1)
17.	Expansion of invasive species	Forest degradation	HM (5); MH (4); S (1); T (1)
18.	Mining /excavation (sand, boulders, stones).	Deforestation and Forest degradation	HM (5); MH (3); S (1); T (1)

HM-High Mountain; MH- Middle Hills; S- Churia; T- Tarai and inner Tarai

1- Very high effect; 2- High effect; 3- Medium effect; 4- Low effect; 5-Very low effect

**Effect of forest fire and grazing in terms of exposure, sensitivity and capacity to address*

Similarly, a total of ten underlying causes are identified as follows:

1. Disproportionate population distribution and migration pattern
2. Poor policies, implementation and conflicting
3. Poverty and limited livelihood opportunities
4. High dependency in forest products and gap in demand-supply
5. Land use policy and insecure forest tenure
6. Weak governance (enforcement, monitoring, planning, implementation, evaluation, MIS and knowledge management)
7. Weak coordination and cooperation among stakeholders
8. Inadequate human resource development and management
9. Low priority to research and development
10. Poor coping strategy to natural disasters and climate change (including effects of climate change)/lack of integrated climate change disaster management

Each of these drivers and underlying causes are discussed in the following sections.

2.2.1 Direct drivers of DD

1. Forest fire

Forest fire is an important driver of forest degradation across the physiographic regions, particularly Churia and High Mountain areas. Every year in dry season from April to June the forest fire is a regular phenomenon across the country. However, there is neither data nor the extent of damage is available. For the last few years, ICIMOD has established a system of forest fire detection and monitoring on the Moderate Resolution Imaging Spectroradiometer (MODIS) sensors on board NASA's Terra and Aqua satellites for Nepal. The system provides basic information on the forest fire with number of fire incidences, their sizes and types along with satellite images. However, the extent of loss and area damaged are not assessed or reported neither by the system nor by the forest agencies. The system recorded around 1500 fire incidents in April and May of 2008, which continuously increased and reached around 6,000 in April and May of 2012 (Figure 7). This demonstrates the extent and trend of forest fire incidence during dry months of April and May in the country.

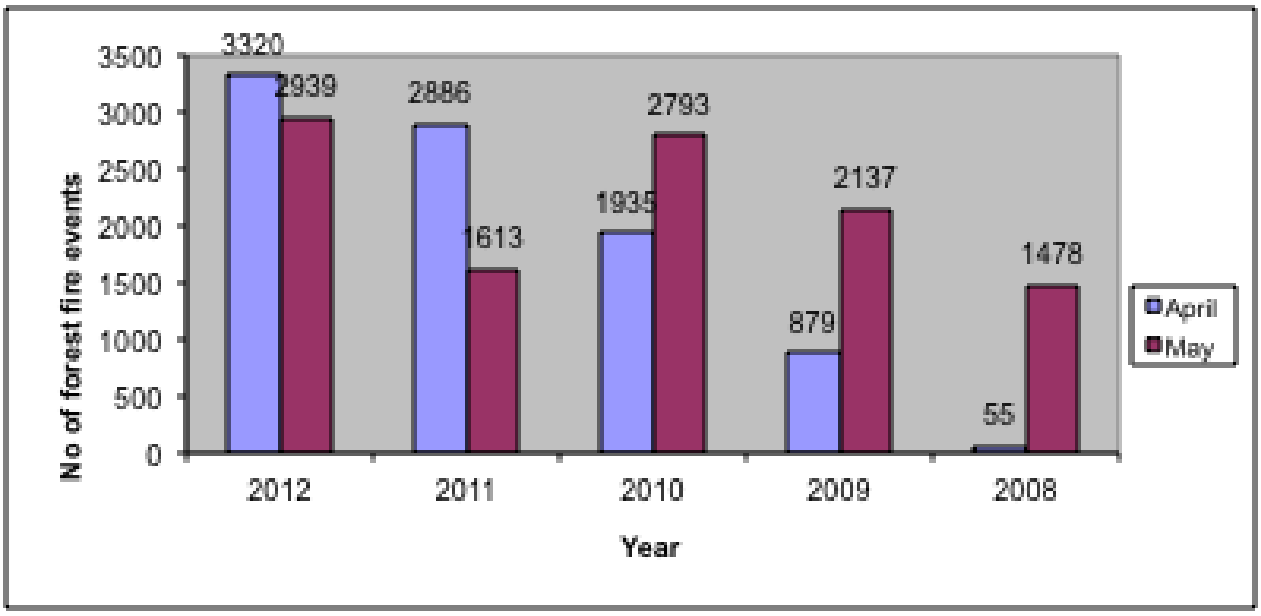

Figure 7. Forest fire incidents in Nepal in two-peak fire season of April and May (2008-2012)
(Source: Baral et al, 2012)

The forest fires damage the regeneration and obstruct the growth of seedlings and saplings, destroy undergrowth and even encourage invasive species in some cases (WWF Nepal/ Hariyo Ban Program, 2013). As forest fire damages natural vegetation and biodiversity it causes the forest floor further vulnerable for soil erosion, floods and gully formation and thus causing forest degradation. However the quantitative information regarding the forest degradation due to forest fire is not available.

Forest fires are regular phenomenon in all physiographic regions, however forests in Tarai, inner Tarai and Churia are more fire prone due to excessive heat and highly flammable dry materials available in the forests during the dry season. In the Middle hills, successful implementation of community-based forestry has made people's engagement in fire control thus reducing the damage. The forests in High mountain areas are also sensitive and vulnerable to fire due the presence of conifer trees with stems cut for torches, thick layer of lichens and mosses covering all parts of trees (Baral et al, 2012). Furthermore, the topography, climatic condition, remoteness, and sparse population make further difficult to bring in control forest fire in the High Mountain region. The main causes of forest fires are anthropogenic due to negligence and occasionally intentional to induce succulent grass growth (MFSC/REDD Cell, 2014). Unintentional fires are mostly escaped from adjoining settlements, farmlands and pasture lands. To reduce the incidence of forest fire and its damage concerted efforts are needed with policy and legal reform, education and awareness, forest fire management, fire detection and control measures, information dissemination and development of partnership and networks.

2. Over grazing/uncontrolled grazing

Overgrazing and uncontrolled grazing are widespread practices in the forests of Tarai, Siwalik, and High mountain areas. However, the grazing pressure in the Mid-hill forests has been drastically reduced due the grazing ban imposed by the Community Forest User Groups. Grazing in Churia is mostly practiced by sedentary small farmers and in High Mountain by nomadic herders (WWF Nepal/ Hariyo Ban Program, 2013). In among the management regimes the government-managed forests are affected most, as there is no

grazing control, however community forests, leasehold forests and the forests in the protected area system are least affected, as there are strict grazing restrictions.

A large number of livestock population of the country get their feed from the forage and fodder from the nearby forests. In the year 2011/12 the total population of cattle, buffaloes, sheep and goats are estimated at 7.2, 5.1, 0.8, and 9.5 million (MoAD, 2012). What percentage of these animals graze in the forest is not available. Nevertheless, they derive a considerable amount of feed from the forests, in many cases beyond the carrying capacity of the forests. Excessive grazing not only affects the regeneration and growth of plants but also degrades the forest land through trampling and promoting soil to erode and thus causes forest degradation. Increase in livestock and expansion of herds in the High Mountain areas affect the forests in three ways- firstly, by cutting more trees for making sheds, fences and for firewood; secondly over grazing and over lopping reduces the reproductive capacity of vegetation and increases soil erosion; and thirdly, clearing more forests area for pasture to meet the growing demands of forage (Baral et al, 2012).

3. Unsustainable harvesting and utilization of forest products

Increased demands for timber, fuel, fodder and other forest products has triggered the excessive extraction of forest products from many forest areas. The Tarai and Churia are the main sources of timber for the construction in the urban centers across the country. However very few forests in these areas are brought under the proper management plans and are subject to unregulated and illegal harvesting. The forests from Similarly, a substantial amount of forest products that includes timber, firewood, shingles for roofs, leaf fodder, bedding materials, nigalo, MAPs and other NTFPs are harvested in High Mountain areas for domestic and commercial purpose. Excessive use of timber for construction, illegal cross-border smuggling for forest products to Tibet Autonomous Region, and repeated lopping of fodder trees are the contributing factors for the degradation forests in the High Mountain areas (WWF Nepal/ Hariyo Ban Program, 2013). The Middle Mountains are less affected by unsustainable harvesting due to the successful expansion of community forestry. However, operational plans of many community forests either not renewed or have failed to consider the sustainable harvesting plans.

Harvesting methods causes substantial damage to the forests particularly in the High Mountain areas. Specific species and live trees are chosen for fuelwood despite dead and fallen trees. Selective felling of specific and optimal sized trees are chosen for timber. Extraction of pine splits are common in remote and inaccessible areas for lighting purpose. A large number of growing young trees are cut to make few usable roof singles leaving behind rest of the harvested wood to rot (Baral, 2005). Other unsustainable and wasteful harvesting includes lopping of fodder trees, collection of forest products without considering the natural flowering and seed producing cycles and regeneration cycles.

4. Weak Forest Management practices (unmanaged/under-managed)

Efforts have been made in the last six decades to intensively manage the forests of Nepal, particularly the productive forests in the Tarai and inner Tarai by implementing forest management plans. However, none of the management plans were implemented. The most of the forests is either un-managed or under-managed leading to the loss of growing stock and decline in forest productivity. So, the weak forest management has been one of the reasons for deforestation and degradation. For the last two decades, emphasis has been given for the intensive and sustainable management in the community forests and collaborative forests.

However, the weak implementation of management plans and conservative management and silvicultural prescriptions has made these forests also far less able to realize their real potentials.

In Tarai forests, a number of practical studies were carried out on stocking, yield and growth for the implementation of Operational Forest Management Plans (OFMPs) in 1990s. These studies showed that the Tarai forests could yield as much as 12 to 15 cubic meter (M3) of wood per hectare (ha) per year if these forests are managed more intensively (Joshi et al, 1995). However, the forests of Tarai is currently yielding very little of this potential productivity. A study carried out by Kanel (1994) projected a gradual depletion and degradation of of forest if the passive forest management scenario is continued. The modeling was carried out for the 30,000 ha of natural forests of Bara, which projected the deforestation of over 7,500 ha and degradation of over 10,000 ha of forests, and only about 12,300 ha of forest would remain as the good forest over a period of 25 years.

5. Infrastructure development (includes manmade disasters)

Infrastructure development is one of the important drivers for the deforestation and forest degradation. Construction of road networks, transmission lines, drinking water projects and irrigation canals, schools, colleges, hospitals, army barracks, police camps, temples and recreational facilities is a common practice particularly in the Tarai and low land Churia. Construction of road networks, hydropower project, transmission lines, trekking trails, and monasteries is more common in the High Mountain and Middle Mountain forests.

The infrastructure not only uses forested land for construction sites but also increases the forest product demand exerting tremendous pressure on the nearby forests. Ecological footprint of infrastructure development is immensely high. The hydropower projects, road networks and irrigation canals are major activities that promote deforestation and forest degradation. Hydropower not only uses forested land but also expands transmission line, access roads, supply of natural resources, and market development. Currently, only 733 MW of electricity is generated from hydropower but a number of hydropower projects with total capacity of 1,044 MW are under construction, and total capacity of 1852 MW are planned and proposed (NEA, 2014). Similarly, thousands of kilometres of transmission lines will be constructed to join the electricity generated from these projects, much of which will likely to go through forest areas. A number of irrigation projects are being implemented, which will also have significant effect on the forests.

Another important construction that causes deforestation and forest degradation is the road network. Till 2012, Nepal has 11,635 km of road networks20. The 20-year road policy of GoN aims to connect all district headquarters and construct Mid Hill East West Highway and upgrade postal roads in Tarai as highway. The impact of these roads will have significant effect on the forests of all physiographic regions. For the last several years, unplanned and haphazard constructions of rural roads have been a common practice in most districts particularly in the Middle Mountains. Such roads are the priority activities of District Development Committees and Village Development Committees and are preferred to go through public forests than private land. The practices of planning, construction and post construction maintenance of such roads are haphazard and destructive causing severe gully formations, landslides, soil erosion and thus forest degradations (Baral et al, 2012).

[20] Road network data from Department of Roads from http://www.dor.gov.np/

6. Urbanization and resettlement

Urban population in Nepal has increased by almost thirteen times from 336 thousands (3.57%) in 1961 to 4,523 thousands (17%) in 2011 (CBS, 2012; Basyal and Khanal, 2001). Several of these towns were developed and expanded in forestland in the past under town development programs and resettlement programs. The urbanization process is continued as market centers and economic frontiers are being developed across the country particularly in tourist destinations, and along the roads and highways.

State sponsored a massive resettlement programmes in the 1960s in Tarai and inner Tarai, which is still continued in different forms (UN-REDD/REDD Cell, 2014) but in smaller scale. The Government has formed different Commissions to distribute land to landless people in the past 40 years and distributed over 140 thousand hectares of forestland (ibid). More recently in 2009, government freed bonded-labourers and settled them in the forested land. A total of 6,472 ha of land has been allocated to 11,768 bonded labourers households in Dang, Banke, Bardia, Kailali, and Kanchanpur district (PSPL/FECOFUN, 2010). Similarly, the forestland has remained the focus for refugees, disaster victims and landless rehabilitation. Such rehabilitations are putting further pressure on forest as people are resettled in the vicinity of the forests and they gradually encroach and expand the land by clearing the forest.

7. Encroachment

Encroachment of forestland for agriculture, settlement, and for market centre is one of the important drivers of deforestation and forest degradation particularly in Tarai, inner Tarai and Churia. Encroachment along roadsides for market development and around the boundary of farmyards is also common practice in Mid hills and High Mountain areas. The data of total encroached forestland is not available. However, a study by Committee on Natural Resource and Means reported 83,452 ha of forestland encroached in 24 districts that include all districts of Tarai, inner Tarai and Churia. The encroachment of Tarai forests and settlement where encroached have been in practice since 1960s when malaria was eradicated. Since then, it has been a tough task for the department of forest to stop the encroachment as people from hills and mountain continually migrate to Tarai in search of fertile land and comfortable life. Until now the pressure for encroachment is still strong and almost all encroachments are falsely linked with landless squatters. The evacuation of encroachment has always been weak and challenges remains due to strong and illicit support of political parties to land seekers, the lack of alternative livelihoods, weak capacity of forest authorities and high cost of law enforcement (UN-REDD/REDD Cell, 2014).

8. Expansion of invasive species

Expansion of invasive alien species (IAS) is seen as one of the drivers posing threats to forest degradation in different parts of the country. A species is defined as alien if it is non-native, non-indigenous, exotic, and foreign and/or introduced to an ecosystem other than its natural home, which is capable of altering the habitats with likelihood to cause economic and/or environmental loss (Tiwari, et al, 2005). Tiwari et al, 2005 identified twenty-one invasive plant species as problematic. Out of these, six species - Ageratina adenophora, Chromolaena odorata, Eichhornia crassipes, Ipomoea carnea ssp. fistulosa, Lantana camara and Mikania micrantha are highly invasive posing high level of threats. Three species - Alternanthera philoxeroides, Myriophyllum aquaticum and Parthenium hysterophorus- are of medium threats; Seven species-Ageratum

conyzoides, Amaranthus spinosus, Argemone mexicana, Cassia tora, Hyptis suaveolens, Leersia hexandra and Pistia stratiotes - are of low threats; and five species -Bidens pilosa, Cassia occidentalis, Mimosa pudica, Xanthium strumarium and Oxalis latifolia- are of non-significant threats.

Invasive Alien Species are more common in tropical and subtropical regions and are "the 'passengers' of deforestation and forest degradation at their early stage of colonization, which later change into 'drivers' by disrupting regeneration process". Among the IAS, Mikenia micrantha has begun covering grassland, wetlands, riverbank and other prime Rhino habitat in Chitwan National Park adversely affecting growth of native plant species (DNPWC, 2067/68).

9. Mining /excavation (sand, boulders, stones).

Stone quarrying for construction materials is widespread practice in the Middle hills and High Mountains. Stones, boulders, pebbles and sand are collected from many rivers in all physiographic regions. However, the haphazard and improper collection in Churia and inner Tarai has seriously threatened the local environment. Such haphazard and improper excavations are localized drivers of deforestation and degradation, which degrades land and forests through increased soil erosion and sedimentation. To control such an indiscriminate collection and conserve the vulnerable landscape of Churia, GoN has recently declared the Siwalik area as Environmental Conservation Area.

2.2.2 Underlying causes of DD

1. Disproportion population distribution and migration pattern

The population of Nepal in 2011 was 26.6 million. Although the average growth has decreased from 2.25% in 2001 to 1.40% in 2011, there is substantial change in migration and distribution pattern among the physiographic regions. About 50% of the population lives in the Tarai region, 43% in the Mountain/Mid-hills areas, and 7% in the High mountain areas. The High Mountain and Mountain/Mid-hills region have continuous negative net migration since 1971 however, Tarai has positive net migration (Table 17) Similarly, people are migrating from the rural areas to urban areas of Nepal. Presently, about 17 percent (4,523 thousands) of population live in urban areas, which was 13.9% in 2011 and 3.57% in 1961 (CBS, 2012; Basyal and Khanal, 2001). The movement of people outside the country, particularly youths going overseas for work has substantially increased over the last decade. The census in 2011 recorded the absent population at 1.92 million against 0.762 million in 2001. Such movement of population is affecting and will affect the consumption and production of forest and agricultural commodities and subsequently on the extent and condition of forests.

Table 17. Net migration of population in three physiographic regions

Place of enumeration	Net Migration			
	1971	**1981**	**1991**	**2001**
High Mountain	-39,959	-261,467	-161,655	-225,103
Mountain/Mid-hills	-359,966	-424,711	-753,923	-830,759
Tarai	+399,925	+686,178	+915,578	+1,085,862

CBS, (2002); Kanel et al, (2014)

The demographic changes particularly population growth and migration has close links with changes in landuse and environmental quality (Ives and Messerli, 1989). Population distribution, and their life styles, access to improved technology, and forest resource management and use system causes positive or negative effect on the deforestation and forest degradation. Lifestyle of majority of population in Tarai is based on agriculture farming while High mountain communities rely on silvo-pastural transhumance lifestyles. Hilly and mountain communities use tree fodder mostly in winter and dry seasons while Tarai people uses grasses from private and public lands. All such use pattern and lifeslyle together with heterogeneous spatial distribution of population across the country has varying degree of effect in area and condition of the forests. There has been a remarkable growth in per capita consumption from NRs 6,802 in 1995/96 to NRs 34,829 in 2010/11 across all population groups over the last 15 years (Kanel et al 2014). Though the per capita consumption of firewood is reduced, the demand for timber is increased by many folds in urban and semi-urban areas thus increasing more pressure or overharvesting in Tarai and Inner Tarai regions and nearby accessible forests of semi-urban areas and newly emerged economic frontiers (ibid).

There is less understanding about the effects of out migration on the forests of Nepal. The high rates of out-migration might have positive impacts on the conservation of forests in one hand. The higher earnings could also increase the consumption of resources in other hand.

2. Poor policies, implementation and conflicting

Forest resources having multiple functions and actors/stakeholders in an agrarian economy is naturally complex and governed by numerous contextual factors (external and internal), externalities and uncertainties. The conservation and management of such resource demands a well-crafted, context specific and flexible policy instrument that are least conflicting with other sectoral policies and supported by an enabling working environment. Moreover, effective implementation of these policy instruments and the corresponding working environment depends largely on the status and extent of governance qualities.

The weak implementation of policies, plans and programs and weak enforcement of legal instruments is in rife making adverse effect on the forests, particularly in the Tarai, inner Tarai, Churia, and High mountain areas. Though the government made a commitment to maintain at least 40% of the land territory under forest cover. But, it has not allocated necessary financial and human resources to fulfil this commitment. Forestry sector gets less than four percent share of total national annual development budget of which about a quarter to half comes from donor sector. Moreover about 90 percent of this budget is spent on operational cost thus leaving less than 10 percent for forest development and management (Kanel et al, 2009). The existing blanket policy and approach does not fit well for the varied biophysical features and nature of forest resources. As a result the highly commercial forests of Tarai are under managed, the integrity of Churia ecosystem is threatened and value of High mountain forest is degrading.

A number of legalizations and regulations such as the Local Governances Act 1998 and its Regulations, The Nepal Mines Act 1966, Mines and Mineral Acts 1985, the Public Road Acts, Water Resource Act 1992 have conflicting jurisdiction and authority over the use of forest area. The kind of conflicts are often discussed but never resolved.

3. Poverty and limited livelihood opportunities

Poverty and limited livelihood opportunities are another underlying causes of deforestation and forest degradation. Agriculture is the main stay of economy employing over 65 percent of total population, where a large percentage of people are small landholder (owning <0.5ha of agricultural land). A total of 1.15 million people (about 4%) are landless (CBS, 2012), and among landholders also 53 percent are small farmers who hold only 18 percent of agricultural land (NLSS, 2010/11). About 25 percent of total population are reported to be living below poverty threshold (less than $1.25/day) and the poverty gap between urban and rural population is -28%, which varies across the ecological and development regions (CBS, 2013).

Rural livelihood is mostly based on subsistence farming system[21] with reliance on livestock and nearby forests. Forest is considered major component of Nepal's agricultural system and ultimate means of livelihoods for rural of poor and landless people. Livelihoods needs of small farmers is met by farming as the agricultural productivity is low. Mountain districts of Nepal mostly from mid and far western region are faces acute food shortage and are adversely suffering from hunger and malnutrition. Poverty is rife and the severity of hunger is alarming with about 28% of household in rural areas and 12 percent in urban areas are considered to be food poor[22] (FAO, 2011). Poverty is one of the main reasons of forest encroachment in Churia, Tarai and inner-Tarai.

The economic growth is hovering around three to four percent over the last three years, the remittance economy has significantly helped in reducing the level of poverty from 42 percent in 1996 to 30.8 percent in 2003 and dropped to 25.4 percent in 2009 (CBS, 2009). However, the landless poor, the indigenous tribes, particularly Chepangs, Raute, Rajis with low social and human capitals and small farmers are least benefitted from remittance. These people have limited land assets and opportunities of off-farm employment in rural areas are also limited therefore they heavily rely on forest resources for making a living.

In addition to seasonal migration for wage labour most of the rural people adopt multi-pronged livelihood strategies primarily based on forest resources such as, collection of forest products, rearing small livestock, and selling of farm products (agriculture and livestock and trees on farm lands) (FORWARD, 2001; Piya et al, 2011). Collection and trade of non-timber forest products contribute up to 50 percent of total annual household income thereby contributing to food security and make a living. The income of NTFPs varies across the development regions and districts accounting from 10% in Jumla to 50% in Koshi hills (Larsen, 2000 cited in Acharya, 2004). People who fail to cope with livelihood strategy or simply for the quest of better life migrate to low land Tarai and inner Tarai and engage in encroachment and cultivation in the forested land.

4. High dependency in forest products and gap in demand-supply

People across the physiographic regions heavily depend on forest products for a number of their direct and indirect needs. However, existing supply system is not supplying enough products to meet these needs. The total energy consumption for cooking, heating and lightening in the year 2008/09 was about 9.3 million tonnes of oil equivalent, of which 87% was derived from biomass of both woody (trees and shrubs) and non-woody (crop residues and other vegetation). Similarly, 2011 census revealed 64% of households using firewood for cooking.

[21] A subsistence farming systems comprises of a farm household, a crop field and a small number of livestock supported by a grazing land and forest. And obtain fodder, forage, bedding materials, fuel-wood and timber from nearby forests.

[22] Food poor is insufficiency of the value of food consumption to meet the requirement of a basic diet.

The consumption of firewood varies across the physiographic regions. Baral et al (2012) have estimated per capita consumption firewood between 7 t/year/HH (for dryland farmers), 12 t/year/HH (for transhumance herders), 1.8 t/year/HH (in market centres) and 6-9 t/hotel/year in tourists centres in High mountain areas. While Kanel et al (2012) reported 456 Kg per capita/ annum in Tarai. Similarly, ANSAB (2010) estimated the consumption of 2316 kg/year/HH in three watersheds representing High mountain (Charnawati in Dolakha), Midhills (Ludikhola in Gorkha) and inner Tarai (Kayarkhola in Chitwan). The consumption of timber at High mountain region is estimated at 19 m3 to construct a typical residential house, 10.77 m3 in emerging towns and 24m3/hotels. While Kanel et al (2012) have estimated about 11.33 m3 of timber for cement concrete house and half of it for a house made of branches and bamboos. Kanel et al. (2012) using simulation model estimated a demand supply gap of fuelwood and timber in the country. The overall supply gap of fuelwood will remain till 2020, but the gap will continue in High Mountain and Tarai till 2030. Similarly, the overall timber supply gap will remain till 2015 but the gap will continue in the High mountain and the Tarai till 2030. (Figure 8). These gaps will continually lead to deforestation and forest degradation if not addressed through gap reduction measures.

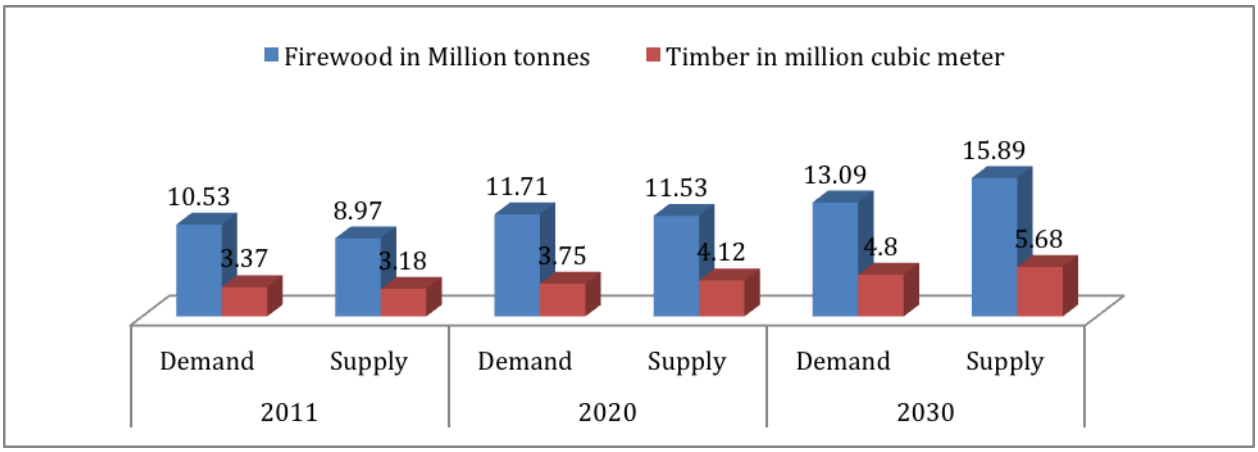

Figure 8. Demand and supply of wood from 2011 to 2030 (Source: Kanel et al, 2012)

Forests not only supplies fuelwood and timber but also fodder, bamboos/nigalo, leaf-litter, thatching grass etc. The demand and supply figures of these products do not exist at national level. However, ANSAB (2010) estimated average annual consumption of 1.67 mt of leaf litter /HH in the three watersheds and Baral et al (2012) estimated the consumption of 9 t of leaf litter/year and about 80-125 kg of green nigalo/year for a dryland farmers in the High mountain region. Similarly, about 36% of Total Digestible Nutrients (TDN) requirement is met from forest land that includes forest, shrub and open grazing (MPFS, 1988). All such dependency of forest products and demand-supply gap is a major underlying cause for the deforestation and forest degradation.

5. Land use policy and forest tenure security

Land use policy and forest tenure security are the two fundamental tools of conserving and managing forest resources in a more efficient, productive and sustainable manner. Landuse policy provides a broad framework for landuse objectives and systems in terms of land capabilities, socio-cultural norms and values, biophysical features and sensitivity to environmental hazard. While tenure security guarantees to enjoy the rights as per

the given tenure system. Thus, in absence of adequate landuse policy and well defined resource tenure and tenure security, forests as a common pool resource is bound to become an open access and degradation is inevitable

The Ministry of Land Reform and Management has lately prepared a land use policy in 2012. However, it is too general for forestry and moreover, its enforcement mechanism has not yet been devised. The MPFS provided a broad framework of forest land use classification in terms of management regimes as government managed forests (productive and protection forests), community forests, leasehold forests, religious forest etc. However, the forest landuse classification system at operational level is blanket approach irrespective of the productivity, accessibility and sensitivity to environmental hazards and socio-cultural values and norms resulting into degradation, particularly in Tarai, Churia and High mountain areas.

The absence of well-defined resource tenure and tenure security23 creates the problem of free riders in the access and use of forest resources (Schalger and Ostrom, 1992), which then becomes the major drivers of deforestation and forest degradation. Though the forest act 1993 has identified only two broad property right regimes of i) private forests and ii) national forests, there are many traditional and customary practices of forest tenure systems that existed across the country. The forestry law didn't recognize such traditional tenure system resulting into conflict with local system and thus driving towards open access and degradation. The various tenure arrangements under different community-based management regimes are also perceived to be insecure due to frequent changes in the regulatory instruments restricting community rights.

6. Weak Governance

Weak law enforcement and regulatory mechanisms, and poor governance is one of the major underlying factors of deforestation and forest degradation in Nepal (WWF Nepal/ Hariyo Ban Program, 2013). Governance, institutions, and sustainable forest management are three closely inter-related elements for the successful and sustainable socio-ecological and economic system. In this regard, forest governance not only refers to government regulation and law enforcement but also involves the political, organizational, and cultural frameworks through which diverse interests of multiple stakeholders and actors are coordinated and controlled (Tucker, 2010).

Of the various aspects of governance, the issues of transparency, corruption, and impunity are considered to be widespread and alarming. Nepal is showing weak performance on each of the internationally recognized indicators of governance of (legitimacy and effectiveness, transparency, freedom and doing in business) and falling in the lowest category on these ratings (Kanel et al, 2009). A study in 28 countries of Asia and pacific region identified corruption control indicators of Nepal has increased (by about 21%) from -0.54 in 2000 to 0.69 in 2010 (FAO, 2010). As corruption is so rampant in all sectors and agencies, forestry being a part of the system has not been able to remain untouched. It has also been the focus of investigation by the Commission for Investigation of Abuse of Authority (CIAA) for bribery and rent seeking over the past several years.

[23] Forest tenure is 'the combination of legally or customarily defined forest ownership rights and arrangements for the management and use of forest resources' (FAO 2006). It determines who can use what resource, for how long and under what conditions (Folke and Berkes, 1995, Schalger and Ostrom ,1992). Tenure security refers to the expectation of the individual user with regard to tenure rights and the norms governing the bundle of rights that constitutes tenure will be enforced by the concerned authority (Robinson et al 2011)

The governance issue is not only in government institution but also in community organizations such as community forestry user groups. CIAA has investigated and filed cases of corruption to many CFUG members in the past few years, particularly in Churia, Tarai and inner Tarai.

7. Weak coordination and cooperation among different agencies

Coordination refers to harmonious functioning through each other's support, and cooperation includes partnering with others in terms of resources, capabilities, and competencies in pursuit of mutual interests (McEntire, 1998). Forestry sector involves a host of actors (mangers, staff, users, and stakeholders) with diverse needs, interests and objectives. The performance of these actors neither aligned to a common purpose nor the interdependency of such actions is understood or internalized in the forestry sector. The efforts of government, users and federations and civil society often seen not only wasted but also counterproductive to each other. Lack of cooperation from district administration and political entities is wide spread while controlling illegal forest activities, particularly encroachment control.

Furthermore, a number of informal institutions[24]with a diverse of objectives and functions do coexist with existing formal organisations/institutions of forestry sector. The cooperation of these institutions in the conservation and management of forests and pastureland, particularly in High mountain areas is not recognized thus encouraging further depletion of forests. Such non-recognition has not only caused degradation of forests but also the loss of indigenous knowledge of forest management and loss of livelihood means of many transhumance graziers (Baral et al, 2012)

8. Inadequate human resource development and management

Human resource development[25] (HRD) and HR management[26] are important aspects of an institution in planning, implementation, monitoring of forest plan and programs and enforcement of policy and legal instruments. However, these important components are poorly developed and managed. Despite a wide-range of training and educational opportunities to forestry staff there are widespread weaknesses in managerial and communication aspects of forestry and also the competencies in regulation, monitoring and facilitation. (MPFS review 2013). Despite of highly competent technical human resources in government forestry institutions they are characterized by weak management and less organized within a poorly managed HR System. The MPFS's emphasis on re-orientation, re-training and education, and institutionalization thereafter has developed a number of competent human resources but neither their potentials are

24An informal institution is an institution, which is subject to an evolutionary development and a high binding force also without formal sanctioning unfolded and associated with a specified place, position, or function. They operate wholly or partly outside formal structures of the state. In some cases they may even actively substitute for the state by providing services (most obviously the resolution of disputes) that the state is not providing, or providing ineffectively (Acharya, 1992)

25 Human resource development (HRD) is planned effort to facilitate employee's learning of job-related behavior, skills, knowledge, and attitude in order to enhance employee's performance and satisfaction and improve organizational efficiency and effectiveness.

26 Human resource management (HRM) is a function to maximize employee performance primarily concerned with how people are managed within organizations, focusing on policies and systems.

capitalized nor they are motivated to remain in government service due to lack of key HR system such as guidelines on working systems (transformation of forestry personnel's from administrative orientation to managing people orientation), transparent working principles for recruitment, terms and conditions, codes of conduct, transfer, performance appraisal, career-path, counseling, training, promotion and grievance handling (MPFS Review, 2013). Many areas in the forestry sector even lack specialists and leaders that can act champions of change. Entrenched cultural and attitudinal issues accompanied by gender equality and social inclusion issues prevalent in government, community-based organizations and NGOs working in forestry has also contributed for inefficiency and ineffectiveness in forestry sector (ibid). All these issues of HRD and HRM have remained one of the important causes for weak governance and law enforcement in forestry sector resulting into deforestation and degradation.

9. Low priority to research and development

Research and development has remained one of the least prioritized functions in forestry sector characterized with lack of research policy and priority areas, poor funding, unmotivated research staff and poor communication and research coordination (MPFS Review, 2014). There are very scant research and development on the management, development, protection and silvicultural aspects of forestry. Researches on cultivation of climate smart trees or Non-timber forest species with high economic, environmental and social values across the ecological regions, harvesting and processing technology are very limited. Similarly, the impacts of different socio-economic factors including migration on the forests and on the drivers of deforestation and forest degradation across the physiographic regions are least known. Very little is known about managing the forests of High Mountain areas, which comprises about 33% of total forest area and about 50 % of total growing stock of the country (Baral, et al, 2012). All such issues have made policy decisions and program formulations less evidence based for appropriate measures to address the drivers of deforestation and forest degradation.

10. Poor coping strategy to natural disasters and climate change

Nepal is susceptible to a number of recurring natural disasters such as floods, landslides, snow avalanches, Glacial Lake Outburst Floods (GLOF), hailstorms, thunderstorms, cold and hot waves, drought, epidemics and earthquakes. According to the Ministry of Home Affairs, 64 districts out of 75 are vulnerable to disasters of some type, out of which 49 districts are prone to floods and/or landslides and 23 are prone to wildfire. The effect of natural disaster is ever increasing. In the year 2012, natural disaster caused death of 419 people, property loss of Rs 1294 million and completely damaged 4,247 houses (MoHA, 2013). The damage was much higher in the last six months of 2014 with death of 443 people, property loss of Rs 16177 million and complete damage of 9383 houses.[27] The effects of natural disasters and climate change will not only impact directly on forests but also indirectly, as the disaster victims' immediate construction needs are met from the nearby forests. Historically, the nearby forest resources have been absorbing the immediate relief of disaster victims across the country, which is still continued. Nepal lacks the appropriate coping strategy to reduce the effect of disasters. Such weaknesses ultimately increase the pressure in forests causing for further

[27] National Emergency Operation Center bulletin accessed from http://www.neoc.gov.np/uploads/news/file/Bulletin%202071_20141209010130.pdf

deforestation and degradation. In order to cope with the effect of climate change, the government has attempted with NAPA and LAPA framework, however they are not well mainstreamed into the annual, periodic planning and management planning of sectoral agencies.

2.3 Assessment of Forest Law and Policy in the Context of REDD+

The Forest Act 1993 and Forest Regulation 1995 are driven by the aim of promoting healthy environment, ensuring development and conservation of forests and utilization of forest products judiciously. They propose not only very tough clauses to prevent encroachment and deforestation but also envisage strong enforcement systems. The policy envisaged, on the other hand, follows more holistic and integrated approach addressing the issues associated with land use planning, conservation of biodiversity, ecosystem and genetic resources, balancing of production and utilization of forestry products, livelihood of poor and private sector development. More broadly, they are relatable in the context of REDD+ strategy.

However, a closer review of the act, regulation and policy in the light of various studies identifying the major drivers of deforestation and forest degradation by distinguishing direct and underlying causes indicates that they appear to embody weaknesses, especially in the context of REDD+. Relatively old acts and policies have been less effective to address many emerging issues and challenges. Many new acts and policies in the other related areas as briefly pointed out in previous sections also additionally reveal that there are overlaps and compatibility problems from the standpoint of mutual inclusiveness and coordination in an effective way. There is lack of clarity over property rights arising from contradictions and inconsistencies between forestry legislation and other laws, such as the Local Self-Governance Act. It is also noticeable that acts related to mines and minerals, water resources, public road and petroleum contradict with the Forest Act.

2.3.1 Weaknesses of Forest Law and Policy in the context of REDD+

A closer review more specifically based on various studies indicates that forest law and policy have both strengths and weaknesses.

In terms of implementation the experience shows that community-based forestry model popularized in the mid-hills has been very successful and hence are cited as some of the best practices. The community forestry program, indeed, has reversed a tendency of fast deforestation and forest degradation in the hills. The protected forest model also seems to be relatively successful as studies indicate. Hence these are vital in the REDD+ context.

But other models introduced through the act and policy seems to be less effective or more problematic. This is corroborated by a number of studies including those that have attempted to identify the drivers of deforestation and forest degradation in Nepal (MFSC, 2010, Baral, Acharya and Rana, 2012 and MFSC, 2014).

In addition, and as mentioned in previous sections, it is clear that both the Forest Act 1993 and National Park and Wildlife Conservation Act 1973, including associated rules and regulations, are silent on carbon tenure (Joshi and Sharma, 2010). Lack of clear provision on carbon tenure may not only create confusion over forest carbon financing but also pose problems to the community forestry as well because all residual rights under current law are with the state and hence prevent communities to articulate their rights. More broadly, lack of clarity over carbon tenure may undermine the parallel initiatives if markets add value of carbon considerably.

Some of the important shortcoming of the act and policy as corroborated by the findings of the consultation workshop at regional and district level from the stand point of REDD+ include:

- **Carbon rights**
  - The Forests Act 1993 and Forest regulation 1995 are framed under the premise that the ownership of all forests land rests with the government. The right to manage and use forest resources has been given to forest users , but the right to carbon is missing.

- **Carbon a forest products or simply a by-product of ecosystem services**

- Existing policies talk about forest ecosystem services but the subsequent legislations (Acts and regulations) are silent about the services generated from forest ecosystems such as water and carbon whether they are forest products or simply an ecosystem services. So, forest carbon need to be defined.

- **Arbitrariness in allocation of forestland for other uses and uniform approach on tenure arrangement**
  - In the absence of a sound forest land allocation policy there is arbitrariness in the allocation of forests for other uses such as for the resettlement of Ex-Kamiayas, landless poor, victims of natural disaster, and for infrastructures for public services such as schools, colleges, hospital etc.
  - The Forests Act 1993 includes strict provisions regarding the use of forests areas for development activities. However, it has no compensatory measures to discourage development projects in forested areas.

- **Inconsistencies among community-based forestry**
  - The Conservation Areas are governed by different acts and by-laws, as are the institutional and benefit sharing modalities. Inconsistencies exist in governance, management and benefit sharing mechanism among Conservation areas, Buffer Zone Community Forestry and other forms of community-based forestry outside the Protected Areas System. Consistency need to be introduced at a broader and conceptual level.
  - A number of operational guidelines updated/amended at regular interval addressing emerging socio-economic and ecological issues of forest resource management in general and community based forestry in particular, however, no such guidelines exist for the operation of conservation areas and the management of public land forestry.
  - The Collaborative Forest Management was started in Tarai in 2002 based on a Cabinet decision. The Directives of Collaborative Forest have also been formulated in 2011, however the provisions in forest legislation is not yet made.

- **Customary use rights and management practices**
  - The existing legal framework of the forestry sector does not recognize the customary use rights and management practices of indigenous communities, particularly not in the High Mountain areas.
  - One of the major gaps in existing laws relates to sustainable utilization of biological resources and equitable sharing of the benefits accrued from conservation of genetic resources. The 'access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their utilization' bill is still awaiting parliamentary approval.
  - National Parks and Wildlife Conservation related Acts and Regulations have limited reference to the rights of indigenous people, particularly the customary use rights and practices.

- **Lack of clarity on tenure arrangements and the role of the Private Sector**
  - Relevancy of the old classification related to national and private ownership of forests amidst diverse forests management regimes and tenure rights lacks clarity.
  - Role of private sector including private forestry in NRM development and alternative energy technology is vital but the existing policies and legal framework have poorly defined their roles, nor do they have provisioned any inceptive mechanism.

- **Conflicts with Sectoral Acts and Regulations**
  - There are serious conflicts between Forest Acts and regulations and LSGA 1996 over use of resources
  - Rights and authorities conflict with the provisions of the Forest Act, and process, procedures and mitigation measures provisioned by the Environmental Acts and regulations.

- Conflicts exist in jurisdiction and authority between the Ministry of Water Resources, and the Ministry of Forests and Soil Conservation affecting the conservation of forests

- **Rent seeking practices, pricing problems, lack of clarity on tenure rights and benefit sharing and problem of transparency and accountability**
  - Tendency of captured practices through manipulation of policy or excessive intervention motivated by rent seeking practices etc.,
  - Timber marketing, including the pricing and auction system poses a problem, especially in the context of forest conservation
  - There are lapses in tenure rights and benefit sharing arrangements under community-managed forestry regimes amidst higher opportunity cost of, among others, forest dependent people's livelihood
  - Discretionary power is deployed amidst quasi-judicial system and CFUG-induced conflicts
  - Accountability and transparency under different tenure arrangements is lacking and consequently causing problems.

2.3.2 Policy and/or programmatic measures taken to overcome the existing shortcomings and their outcomes

Nepal regards REDD+ as a potential opportunity and viable source of sustainable finance for investment in forest management, forest conservation, and forest restoration to boost multiple benefits including biodiversity conservation, watershed management, enhanced resilient capacity and poverty reduction, among others. REDD+ is one of the highest priority projects (categorized as P1) of the government as evident from the budgetary documents. Furthermore, the current Three Years Plan (2013-2016) incorporates a working policy to this area for taking necessary action to develop institutional infrastructure to capture potential benefits of REDD+ implementation.

A midterm progress review on RPP implementation reveals that in some areas progresses have been satisfactory and in some others progress has been either slow or insignificant (MFSC, 2013). In national REDD arrangement and management, assessment of land use, land use change drivers, forest law, policy and governance, and national forest monitoring systems, the progress has been satisfactory. The progresses in consultation, participation, outreach, REDD+ strategy options, social and environmental impacts, information system for multiple benefits, other impacts, governance, and safeguards related activities have been slow.

Apart from major forest related policies like the climate change policy (2011), the land use policy (2012), and the rangeland policy (2012), a new forest development strategy has been drafted and is in process of approval. In addition, the revised National Biodiversity Strategy Action Plan (2013) and the Forest Encroachment Control Strategy (2012) have been introduced and the Forest Products Sales Authority (2013) has been established: all important steps in the REDD+ readiness preparation process.

Furthermore, some of the elements contained by the R-PP have been expedited including the development of a reference scenario, design of a monitoring system, and the design of a monitoring and evaluation framework. Having said that, the lack of timely donor funding, administrative, procedural and other delays, problem of inter-sectoral ministerial coordination, policy clarity and responsibility dilemma's amongst concerned ministries, and the political transition affecting timely formulation or revision of rules and regulations, are some of the constraining factors for the timely preparation of some of the above.

2.3.3 Way forward to address the key drivers of deforestation and forest degradation through refinement in policy, law and implementation approaches

Notwithstanding the positive contribution of many new initiatives as a part of R-PP, still many lapses in policy, law and implementation approaches are apparent. It seems, less clarity or some ambiguities on the scope of

REDD+ strategy is also adding some complexities. Nepal's heavy reliance on land-based resources makes it hard to justify protection of any land or forest solely for mitigating emissions. Over dependence of people on land and forests has a strong stake in land use. For instance, in most of the Tarai forest opportunity cost of protecting forest land is high because of high fertility of such a land. Therefore, for discouraging substitutability, forest and land policy has to be mutually reinforcing to cope with people's livelihood and deforestation problem simultaneously.

A closer review indicates that reforms and improvement in three fronts following more forward looking approach will be essential. Such an approach is relatable in the changed political milieu in which state restructuring and federal system of governance is the principle agenda of New Constitution. The devolution of power and authority at the lower tiers of state coupled with inclusive and participatory democracy from the grass roots will be the key ingredients of the new system. At the same time, experience shows that too many policies with corresponding division of responsibility among numerous agencies but without fully revised or extended legal bases complicates implementation problems. This is more so in a situation where both coordination and accountability are major problems.

Considering all these, may be a Unified Act covering both mitigation and adaptation related policies at the same time stipulating the power, authority and responsibilities more candidly to related institutions could be a better alternative for coherency in policies, coordination in implementation and strengthening of accountability in each responsible institution. In the way forward approach, in addition to highest priority on improving law enforcement and overall forestry sector governance, promoting scientific forest management, introducing efficient forest product utilization technologies, reclaiming and restoring encroached forestlands and controlling further encroachment and strengthening and expanding community based forest management, focus should be given on alternative energy, agro-based private forestry and poverty and livelihood related issues.

Other related areas needing equal focus include capacity enhancement of user groups and government forestry staff, controlling and managing invasive alien plant species, designing and implementing effective forest fire control systems, controlling overgrazing and introducing participatory land use evaluation and land use planning system. As a part of such an improved rule, policy and implementation approach, it is necessary to recognize local livelihoods as a driving force for conservation of community forests. The existing rule granting tenure rights and benefit sharing in the community forestry also needs improvement with more explicit provisions for incentive and better enforcement.

2.4 Assessment of governance situation in the context of REDD+

2.4.1 Existing governance structures and mechanisms – the extent to which they are conducive to REDD+

As per the forestry legislations, the Department of Forests and Department of National Parks and Wildlife Conservation has the full authority to control and manage national and protected area forests. The Department of Forest is also responsible to regulate private forests. Local communities, mainly community forest user groups, now manage more than one third of the forest area under their own forest management plans, approved by the concerned District Forest Office (DFO) or protected area warden. Today majority of the hill forests are under such a community management program. In contrast, most of the Tarai and mountain forests are under government control and management. By rule, all forests should be managed based on the approved management plans.

In Nepal a worst deforestation has been experienced in the last 30 years. Poor governance has been one of the important factors for deforestation. The governance problem has been more serious and challenging in Tarai forests. The client and patronage system perpetuated at both national and local level institutionalizing rent seeking practices have been the major contributing factors. The over politicization of bureaucracy dictating the placement or reshuffling of personnel frequently followed by product selling decisions motivated by commission or corruption is the most common (Paudel *et al.*, 2006 and CNRM, 2010). Weak law enforcement and absence of robust local institutions have provided abundant grounds for timber smuggling,

particularly in Tarai. The institutional capacity of the government forestry authority is equally weak due to the lack of technical forest expertise and there is also a dearth of weapons for the armed forest guards to ensure effective patrolling and protection (CNRM, 2010). The migration and resettlement of people from the Middle Hills has persistently added governance problem. At the same time, coordination and cooperation among different government agencies, such as the Ministry of Home Affairs and the Ministry of Land Reform, has remained a challenge (GoN, 2008). As primarily state owned, forest land is commonly targeted for the construction of roads, canals, hospitals and schools etc. There is also continuous pressure to release forest lands for non-forestry purposes. The distribution of land has often been guided by potential political gain rather than by resolving the landless problem of most deprived people leading to continuous threat of high disturbance to the forest areas (Upreti *et al.*, 2011). In the lower temperate region and sub alpine and alpine areas of Mountain under government forest also, problem of forest degradation is high with equal pressures on non-timber forests (Baral, Acharya and Rana, 2012).

From the governance point of view, community-based forest management has been the most successful. Today about one-third of forest area is under the control of local forestry groups covering about 40 percent of the country's population. Once critically degraded Nepalese hills have now turned into green landscapes, resulting in increased supply of forest products and a substantial increase in ecosystem services. The deforestation rate is lower in community-managed forests (Kandel and Neupane 2007). Tenure security over land and forest resources is the key inducing factor. Today, under various decentralized and community based management schemes, parts of national forests are handed over to local communities based on approved operational plans. Use and management rights are transferred to the identified groups which are subject to periodic inspection from the state forest authority. This community forestry system is part of a wider agro-ecological landscape that provides multiple livelihood benefits to local communities. Despite such successes, there are some emerging governance problems within the community managed forests too due to elite dominance and secret relations between local political leaders, forest officials and timber traders (Iversen *et al.*, 2006 and CNRM, 2010).

From the standpoint of addressing deforestations and forest degradations problems, governance is a major challenge. Apart from a mismatch between causes and measures, poor implementation has been a major problem. In many instances, law enforcement has failed to address underlying causes of deforestations and forest degradations adequately. The governance measures have often been limited to the forestry sector despite challenges emanating from other related sectors. For instance, encroachment, road construction and fuel wood collection - having close link with agriculture, infrastructure and energy sectors - is poorly coordinated from an overall governance perspective. Importantly, there is a poor system in place in terms of transparency and accountability at political, bureaucratic and community levels. The experience so far additionally indicates that a drastic reform in the governance of government managed forest especially in the Tarai and Mountains will be required in which alternative tenure arrangements may need to be explored. In the community forestry also, some better alternatives to address emerging governance problems may be required.

2.4.2 Measures taken in the past to overcome the identified shortcomings and their outcome

Many recent initiatives indicate that with the beginning of REDD+ readiness processes, Nepal is developing or revising many required policies, acts and institutional frameworks which are aimed at improving the governance system to a greater extent. Design of institutional structures and mechanisms have been driven by the aim of ensuring law enforcement, strengthening coordination among concerned agencies and monitoring of activities and implementing anti-corruption measures through the Commission for Investigation of Abuse of Authority (CIAA) and National Vigilance Centre (NVC). There are also attempts to expedite court cases for early decisions.

A new national forestry sector strategy has been drafted in which governance forms one of the cornerstones. Similarly, formulation of a new forestry act and a new forestry sector policy is in the offing which gives priority to the governance related issues and problems.

In parallel, government has formed a high level committee as a higher institutional body to address the deepening deforestation and forest degradation problem in Churia area. For facilitating the implementation of forest management activities, sustainable forest management indicators for government managed forests have been endorsed. Similarly, the principle of scientific management of forest has been adopted and its piloting has been started in some places. In addition to preparing community forestry guidelines, initiatives have also been taken to develop SFM indicators for community forests.

2.4.3 Way forward to address the deforestation and forest degradation through improvement in governance situation

Notwithstanding many new initiatives, there are still critical gaps in the governance system in the context of REDD+. It requires a result-focused governance system so as to ensure full compliance to the rules, regulations and policy measures. Indeed, there is urgency in this area in view of deep rooted rampant corruption, weak law enforcement and rent seeking practices, both vertically and horizontally. Strengthening of weak state institutions added by dismantling of patronage and clientelism type system driven by vested political or economic interest will be the key in the reform process. A revisit to the quasi judiciary system will also be essential to make the decision making process more accountable and transparent.

It should be recognized that governance related issues are much larger than economic incentive driven deforestation and forest degradation. This means that national REDD+ strategy must incentivize reforms in policy, governance and forest tenure arrangements in an integrated manner. In such a governance framework, both intra-sectoral and inter-sectoral integrated approach will be essential which requires effective internal as well as inter-ministerial coordination driven compliance mechanism for ensuring the implementation of policies and acts. The reforms in intra-sectoral governance system require that enhancement of forest conservation and ecosystem services become the integral part of forest utilization and management. From the larger sustainable development perspectives also, such a governance approach will be essential.

The national REDD+ coverage demands much more coordinated inter-sectoral governance system in view of two way causation among multiple institutions. For instance, REDD+ would have impact on sectors like agriculture, energy and infrastructure more prominently. Conversely, isolated policies in these sectors would have very adverse effects on emissions reductions as the drivers of deforestation and forest degradation indicate. As studies indicate, Nepal's deforestation dynamics are more diverse, complex, and location specific. The illegal logging, timber smuggling and encroachment are the most common factors in the Tarai. Fuel wood collection and road construction have considerably affected the Hills and logging and fuel wood collection are the key factors in the Mountain region. Similarly, problems with government-managed forests are different from those in community forests and other community-based forests. Open access situation has additionally induced deforestation and forest degradation in some parts of Tarai. Weak governance in community forestry has resulted in over-harvesting in many instances. These drivers stem from sectors like agriculture, energy and infrastructure closely associated with not only economic and technological factors but also political and governance related factors. This entails on the need of enhancement of governance in a more coordinated way for the successful implementation of REDD+ in Nepal which already pointed out above may require a Unified law covering broad natural resources related areas.

More precisely, accountability and transparency at various institutional levels is the key for enhancing the governance system. This requires that apart from effective and time bound result oriented review and monitoring system at both national and local level independent oversight bodies from the centre to the district level are formed to help in streamlining the governance system. An important ingredient of this should be that a system of transparency is enhanced simultaneously. There is a need of a system in which reliable and up-to-date information on forest resources, harvesting operations, deforestation and forest degradation, trade of forest products, and overall progress in enforcing law, policies and programs are regularly disseminated with easy access to all them.

2.5 Strategy

2.5.1 Identification and selection of strategy

This section presents the strategies and major strategic actions that will address the drivers of deforestation and forest degradation (discussed in section 2.2) and lead to achieve the vision, mission and objectives (discussed in section 1.1). These strategies are derived, primarily, by reviewing and analyzing the strategic options presented by RPP (MFSC, 2010) and SESA (REDD Cell/MFSC, 2014) complemented by a number of other studies[28], consultations carried out in the process of strategy formulation, and best professional judgment and expert opinions from the consortium members. A total of 13 strategies are identified and for each strategy several strategic actions are identified. The strategies and strategic actions and their corresponding objectives are listed in box 2.1. The brief overview of the strategies are:

S14. Enhancing carbon stocks and reducing carbon emission

S15. Conserving biodiversity enhancing the integrity of ecological systems

S16. Promoting private and public land forestry

S17. Improving land uses

S18. Clarifying forest tenure and carbon rights and sharing fair benefits

S19. Promoting enterprise, livelihoods and employment opportunities to forest dependent poor and marginalized

S20. Increasing agricultural productivity for small and marginal farmers

S21. Increasing access to affordable and efficient alternative wood and energy

S22. Developing synergy among various sectors, sectoral policies and legal framework

S23. Strengthening institutional performance and service delivery

S24. Enhancing capacity, capability and improving collaboration and cooperation

S25. Promoting forest and climate-friendly infrastructure planning, construction and maintenance

S26. Establishing and maintaining forest information, monitoring, reporting and verification mechanism

The strategies covers a wide range of areas of policy and measures, management practices, governance and institutional strengthening, capacity enhancement, and policy and sectoral synergy development in order to achieve REDD+ outcome of *a) Reducing emissions from deforestation; (b) Reducing emissions from forest degradation; (c) Conservation of forest carbon stocks; (d) Sustainable management of forest; and, (e) Enhancement of forest carbon stocks.*

[28] Other studies include: ANSAB, (2010); CNRM (2010); Baral et al, (2012); MFSC/REDD Cell, (2014); PSPL/FECOFUN, (2010); REDD Cell (2012); UN-REDD/REDD Cell, (2014); WWF Nepal/ Hariyo Ban Program, (2013); WWF/TAL (2003); A draft Forestry Sector Strategy, 2014 prepared by MFSC; and a draft Low Carbon Development Strategy 2014 prepared by MoEST.

Box: 2.1 Strategies and Strategic actions

Objective # 1: To reduce carbon emission by intensifying sustainable management of forest resources and minimizing the effects of drivers of deforestation and forest degradation across the ecological regions. (S # 1,2,3,4)

Outcome 1.1: Forest productivity increased and integrity of ecological system maintained through sustainable forest management and conservation practices.

Outcome 1.2: Policy and measures to develop forestry, to address drivers of deforestation and forest degradation conducive to ecological regions in place, and carbon stock increased.

Strategies:

S1: Enhance carbon stocks, increase supply of forest products, and reduce carbon emission through sustainable management of forests, land rehabilitation, shrubland management, and by addressing DD in all management regimes.

Sustainable management of forests increases the supply of timber, fuelwood and other forest products so that illegal and over harvesting decreases. Similarly, the management of forests, shrubland and land rehabilitation improves the quality of forests and land thus enhancing carbon stocks. The improvement in management planning of forests and protected areas with provision to address DD reduces carbon emission.

Major Strategic actions:

1.1 Identify and delineate forest for different management modalities and promote appropriate community-based management models

1.2 Intensify sustainable management of forest (SMF) to enhance the function of forest ecosystem and increase carbon sequestration in all community based management models.

1.3 Update and improve management plans (district forest management plans, and Protected Areas management plans, and operational plans of CBFM) with provisions of carbon stock measurements, carbon monitoring methods, fire management, grazing control, invasive species control.

1.4 Enhance community participation and support for the control and management of forest fire, grazing and encroachment.

1.5 Recognize customary forest and pasture management practices by including good practices into forest and pasture management plans

1.6 Strengthen fire control capabilities at district and local level with fire management plans, fire-fighting capacity building, fire monitoring, fire fighting equipment and insurance mechanisms.

1.7 Rehabilitate degraded land and shrublands through appropriate land rehabilitation and shrubland management measures.

1.8 Increase the supply of harvested wood products for building materials and furniture to substitute high-energy intensive metal products and reduce emission.

S2: Promote adaptive ecosystem-based approaches and integrated watershed management to conserve biodiversity and enhance the integrity of ecological systems across the landscapes.

REDD+ provides additional incentive to protect carbon stocks and co-benefits. The co-benefits include increase in the value of biodiversity, better ecosystems for climate change adaptation, more resilient ecosystems for climate change adaptation (MFSC, 2014), conservation of watershed and rehabilitation of

degraded land.

Major Strategic actions:

2.1 Promote the landscape conservation and climate resilient approaches for ecosystems and biodiversity management.

2.2 Improve the management of Protected Areas by promoting Integrated Conservations, participatory models and ecotourism

2.3 Assess the status of invasive alien species in PAs and community-based forests and identify and implement appropriate remedial and preventive measures.

2.4 Promote biodiversity conservation in managed ecosystems for sustaining livelihoods [including through local land use planning; and complementary implementation of CBD and UNFCCC (REDD+ co-benefits)]

2.5 Develop and promote Payment for Environmental Services (PES) for reduced emissions, watershed management, biodiversity conservation and for sustainable agriculture interventions.

S3: Promote private and public land forestry with appropriate financial incentives, simplified regulatory provisions and technical support mechanisms to create new forests.

The scope of private forestry particularly in Tarai, inner Tarai and Mid-hills is very high in order to meet the growing demand of wood products. Similarly, forests can be expanded in public land under transmission lines, alongside highways and irrigation canals, on river banks and flood plains. The programs to promote private involvement and investment in the production of forest products not only increase the sustainable supplies but also enhances rural incomes and creates 'green' jobs, which will ultimately reduce the pressure on government forests and help reduce the emissions.

Major Strategic actions:

3.1 Promote private forestry by simplifying administrative and procedural process, and with tax incentives.

3.2 Support and facilitate the nursery and plantation of indigenous and fast growing tree species with seed, seedling, research technologies and information (on growth and yield).

3.3 Establish financial schemes accessible to private tree growers and forestry entrepreneurs, particularly to those creating jobs and other benefits to women, poor and marginalized groups.

3.4 Promote appropriate agro-forestry/forestry in marginal, abandoned and drought prone lands

3.5 Promote forestry on community and abandoned land including flood plains, river banks within and outside forest areas with plantation, natural regeneration and other appropriate interventions with people's participation particularly, poor and marginalized households (Tarai)

S4: Improve land uses across the physiographic regions (Tarai, Siwalik, Mid-Hills and Mountains)

Land use planning incorporating economic and ecosystem values of forests are key for controlling the conversion of forests into other land uses. The Ministry of Land Reform and Management has lately (2012) prepared a land use policy but the mechanism to translate the policy into plan and practice has not yet developed. Similarly, the absence of forest land use classification in terms of productivity, sensitivity, accessibility, disaster hazard, and climate change vulnerability is resulting in degradation of forests in many parts of the country, particularly in Tarai, Churia and High mountain areas.

Major Strategic actions:

4.1 Establish spatially explicit information systems on land use potential, allocations and potential conflicts/complementarity with REDD+ strategies.

4.2 Develop and implement economic and market-based incentives packages to promote optimal land use across the physiographic regions.

4.3 Carry out forest zoning in each district through a participatory processes and implement phased transfer into different management modalities.

4.4 Develop community-based forestry approaches in High Mountain areas and Churia areas (apart from existing community-based forestry) considering the specific context of High Mountain and Churia areas.

4.5 Carryout Climate Change Vulnerability Assessment of forests in each district and mainstream it into District Forest Management Plan, Watershed Management Plan, National Park or Wild Life reserve Management plan, and Forest operation plans of community based forestry;

4.6 Promote increased use of GIS and remote-sensing/spatial planning applications and expand or update hazard mapping of delineated zones, based on climate change.

4.7 Control haphazard mining and excavation (of soil, stone, pebbles, bolders, sand) through effective planning, implementation and enforcement.

4.8 Improve public awareness and education concerning climate change risks, uncertainties vulnerability and benefits of landuse planning.

Objective # 2: To ensure fair and equitable distribution of carbon, non-carbon and environmental benefits of forests among right holders. (S # 5)

<u>Outcome 2.1:Policy and institutional arrangement securing tenure and carbon rights and fair benefit sharing in place.</u>

<u>Outcome 2.2:Forest dependent poor and marginalized groups benefited from increased access to forests and decision-making.</u>

Strategies:

S5: Clarify forest tenure, ensure carbon rights and fair benefit sharing among various right holders

Fair benefit sharing among users, particularly of women, *Dalit*, Indigenous People, and other marginalized groups need to be ensured for the sustainable management of forests. For this, safeguarding the tenure security of forest users and clarifying their carbon rights is the most essential elements.

Major Strategic actions:

5.1 Safeguard tenure security of forest user groups to access, manage, sustainably harvest, use and sell forest goods and services in all community-based forest management regimes

5.2 Define, clarify and accommodate carbon rights in relation to land and forests within existing policies and legal instruments.

5.3 Increase and ensure access to forests, decision-making and benefits to women, *Dalit*, Indigenous People, vulnerable groups, forest dependent people, distant users, and other marginalized people.

5.4 Establish clear and legally defined mechanism for the sharing of carbon, non-carbon benefits and payment of environmental services among right holders.

5.5 Actions suggested by TS

Objective # 3: To increase livelihood assets, food security and diversify employment opportunities of forest dependent people, particularly poor and marginalized (S # 6,7,8)

<u>Outcome 3.1: Income and employment of forest dependent poor and marginalized communities improved</u>

through enterprise development.

Outcome 3.2: Small and marginal farmers friendly climate smart technologies mainstreamed into forest and farmland management practices and agricultural productivity increased.

Outcome 3.3: Forest-dependent poor and marginalized people friendly alternative energy and wood technology developed and promoted.

Strategies:

S6: Promote forestry and non- forestry enterprise development and enhance livelihood options and employment opportunities for forest dependent poor and marginalized communities.

The pressure for deforestation and forest degradation cannot be reduced unless the needs and issues of forest dependent people are eased with alternative measures. The livelihood needs of poor and marginalized particularly, women, *dalit*, *janajati*, indigenous people can be addressed with increased employment opportunities by promoting forestry and non-forestry enterprises.

Major Strategic actions:

6.1 Develop policies and capacity to encourage private investment in efficient and alternative timber technologies (e.g. bamboo housing, timber drying, timber treatment, timber processing).

6.2 Invest in sustainable forest-based enterprises to create more employment opportunities in the forestry sector (for both timber and NTFPs, including ecotourism) producing finished forest products for domestic and export markets.

6.3 Develop mechanisms to engage the private sector in forestry in the entire value chain of forest products from planting to end-product development.

6.4 Scale up investment in non-forestry sector employment programs and off-farm income generation activities targeting rural and urban (poor) areas to reduce forest dependency and demand for forest products

6.5 Promote vocational education and skill-based training opportunities for enterprise development and forest operations (harvesting, logging, saw-milling, carpentry etc) for forest dependent poor and marginalized communities.

6.6 Improve access to alternative technologies (eg small sawmills carpentry, food processing, efficient stoves, kilns, briquettes, power looms, etc) by providing information, knowledge and loan services for forest dependent poor and marginalized communities.

6.7 Incentivize and support Forest User Groups in all community-based forest management regimes, also linking with local government resources (eg matching funds, and resource leverage) to create incomes, livelihood options and job opportunities for forest dependent poor and marginalized communities.

6.8 Design and implement off-farm income generation, and vocational training (bamboo crafting, animal husbandry, vegetable farming, carpentry etc) paired with micro-finance opportunities for forest-dependent poor and marginalized households of the communities.

S7: Increase agricultural productivity for small and marginal farmers by providing sustained supply of inputs for agriculture intensification and contribute to food security.

Effective implementation of REDD+ needs a progressive increase in agricultural productivity and contribute in the food security. However, the increase in yield also has implications for agricultural greenhouse gas emissions. So, it is necessary to identify means to increase productivity without major agricultural emissions and other adverse environmental effects. In this context, responding the needs, interests and rights of small

and marginal farmers is particularly important.

Major Strategic actions:

7.1 Intensify agricultural practices with identification of climate smart species and technology for agroforestry, organic farming, and use of alternative sources of fertilizer.

7.2 Promote development of policies supportive of small-scale sustainable agriculture (e.g. relating to agricultural tariffs, subsidies)

7.3 Support in the application of Sloping Agriculture Land Technologies (contours with fodder trees/grasses in bari lands)

7.4 Increase fodder and forage production in community based forestry and support to develop fodder and forage resource center.

7.5 Promote multi-purpose fodder management, stall feeding and scaling up of fodder reserve systems, especially silage and hay, for use during slack periods

7.6 Support to increase access to crop & livestock breeding and husbandry improvement programs

7.7 Conserve water sources and promote improved water harvesting and management technology.

S8: Increase access to affordable and efficient technology of alternative wood and energy.

Increase in access to affordable alternative wood and energy reduces the use of wood and thus the pressure in the forest resources. Promotion of alternative wood technologies improves efficiency in wood use. Biogas has tremendous potential to reduce the need for fuelwood particularly in rural areas. Each biogas plant replaces the need for approximately 4.5 tons of fuel wood/year, or roughly 5.1 tons of CO2e/year and additional climate benefits of reduced methane emissions (MFSC, 2014). Similarly, efficiency improvements of cooking stoves and improved kilns have benefits of addressing DD and additional social and environmental benefits.

Major Strategic actions:

8.1 Increase investment and promote fuel wood efficient and alternative energy technologies (including improved kilns and cooking stoves) to reduce fuelwood demand.

8.2 Promote sustainable, cost-effective (and increase availability and affordability of) renewable energy sources (e.g. Biogas, Access to electricity, Solar power) linking the energy end-use to enterprise development/income generation.

8.3 Develop mechanisms to increase access to alternative energy technologies for forest-dependent poor and marginalized people.

8.4 Promote cost effective wood technologies (eg particle board, pressed board, timber treatment, timber processing, bamboo housing etc) and increase access for forest-dependent poor and marginalized communities.

Objective # 4: To improve and harmonize policy and legal framework to harness carbon and co-benefits; strengthen institutional capability and improve governance of forest agencies. (S # 5,9,10,11,12)

Outcome 4.1: Sectoral policies and legal frameworks harmonized and collective efforts attained for climate change mitigation and adaptation.

Outcome 4.2: Service delivery system and governance improved through institutional reform and capacity enhancement of concerned stakeholders.

Outcome 4.3: Climate smart infrastructure planning, construction and maintenance tools and techniques with appropriate safeguard measures in place and direct/indirect impacts on forests minimized.

Strategies:

S9: Develop synergy among various sectors, sectoral policies and legal frameworks for a shared understanding and collective efforts for climate change mitigation and adaptation.

REDD+ strategy has implications for other sectoral policies and strategies and it is also affected by the strategies and policies of many other sectors. So, harmonization among various sector is critically important for synergetic efforts and smooth implementation of strategic actions. Appropriate mechanisms need to be developed to address cross-sectoral conflicts at central, regional and district levels.

Major Strategic actions:

9.1 Identify and harmonize contradictory issues in cross-sectoral policies and legal frameworks (e.g., among Forest Act 1993, National Parks and Wildlife Conservation Act 1973, and other acts).

9.2 Improve policy coordination among Forest, Soil and water conservation, Land Reform, Agriculture, Local development, Energy, and Physical planning for effective integrated planning, monitoring and evaluations of development projects.

9.3 Strengthen multi-stakeholder and integrated planning approach at regional/landscape and national levels, in order to seek consensus-building, validation and clarify sector and extra-sectoral commitments.

9.4 Institutionalize mechanisms for promoting policy and planning linkages among the MFSC, National Planning Commission, and ministries responsible for finance, infrastructure, energy, land reform and agriculture.

9.5 Develop fiscal policies for investment to climate change mitigation including performance-based payment mechanisms.

S10: Strengthen institutional performance and service delivery system through institutional reform, capability enhancement, and good governance practices.

Forestry sector administration can be characterized by over administration largely governed by the public sector administration of GoN. In the past two decades many efforts were made to reform the forest administration (for example in 1989, 1993, 2000). After 1990's people's movement and further after 2006 second people's movement, Nepal's institutional landscape has significantly changed with active and vocal civil society, expansion of community based organizations and their capacity, increased federations, and greater public awareness about the need of institutional inclusion, equity and good governance. However, the performance and capability of forestry sector organizations have not adequately improved to respond in these changed landscapes.

Major Strategic actions:

10.1 Re-structure institution and improve forest governance to enhance service delivery, accountability and transparency of all concerned agencies at all levels

10.2 Develop incentive and penalty system for both government and Forest User Groups to address illegal harvesting, and illegal trade with confidential system for whistle-blowers to report illegal practices.

10.3 Review and update judiciary and judicial processes and strengthen forest law enforcement to control illegal harvest, trade of forest products, encroachment and other forest offences.

10.4 Strengthen multi-stakeholder forums such as FSC at center and DFSCC at district level.

10.5 Adopt REDD+ international standards on participation, inclusion and Free, Prior, Informed Consent (FPIC).

10.6 Ensure adequate representation of women, poor, indigenous people and socially marginalized groups in key forestry decision-making bodies and processes

10.7 Recognize the traditional and customary practices of forest management and incorporate appropriately in community-based forest management with due consideration to their socio-cultural values, particularly in High Mountain areas.

10.8 Establish and strengthen grievance-addressing mechanisms that is gender-sensitive and respond to people's grievances and concerns

10.9 Develop and implement participatory M & E mechanisms and promote public hearing and public audits - especially at district and VDC level.

S11: Enhance technical, managerial and leadership capacity; groom and support champions of change and improve functional collaboration and cooperation among all stakeholders.

Capacity of human resources was well recognized by the MPFS in 1989 and thus took one of bold strategies of training and re-orienting of entire staff of MFSC, which has made a significant effect in enhancing community engagement in forest management. Similarly, the emergence of active and capable civil society, community organizations, federations and climate change issues such as REDD+ has necessitated forestry staff further capable, competitive, and productive. For an effective implementation of REDD+ technical, managerial and leadership capacity of forestry staff and all stakeholders need to be strengthened.

Major Strategic actions:

11.1 Improve mind-set, leadership and management competency, commitment and morale of forestry personnels.

11.2 Increase awareness, technical, leadership and managerial capacities of all stakeholders in all aspects of REDD +, particularly of women, *Dalit*, IPs including political leaders and parliamentarians.

11.3 Incorporate forest carbon and conservation elements in school curriculum

11.4 Develop functional collaboration and cooperation with security forces, media, and civil society to control illegal forest activities.

11.5 Control cross-border illegal trade of forest products through inter-country cooperation with Indian and Chinese (Tibetan) authorities

11.6 Sensitize various actors on issues of DD and forest sector governance

11.7 Promote and support partnership among government, community, and private sector to enhance the performance of government and Local Forest User Groups.

S12: Promote forest and climate-friendly infrastructure planning, construction and maintenance - ensuring that location and applied technologies minimize both direct and indirect impacts on forest.

There is a tendency of focusing on the forest land for infrastructure development across the country. This makes not only the loss of forest land but also the increased pressure for the remaining forest due to increase in forest product demand. In order to reduce the direct and indirect impact infrastructure development in forests an effective coordination between forestry sector and other development sector is

needed at different levels during planning, implementation, monitoring and evaluation.

Major Strategic actions:

12.1 Ensure environmental, social and economic measures in infrastructure development and maintenance (Hydropower, transmission lines, highways, rural roads, irrigation canals, railways etc)

12.2 Implement climate smart infrastructure planning, implementation and monitoring ensuring social and environmental safeguards.

12.3 Avoid forest area for infrastructure development, and make compulsory provision of tree planting to substitute forest cleared if any.

12.4 Ensure effective implementation and compliances of IEE and EIA for all types of forest land use conversions including tourism ventures, settlements, road construction, hydropower and transmission lines, expansion of conservation areas.

Objective # 5: To establish and maintain a robust Forest Management Information System with strong monitoring, reporting and verification mechanisms (S # 13)

Outcome 5.1:A national credible measurement, monitoring, reporting and verification system established with well functional Forest Management Information and Knowledge Management System.

Strategies:

S13: Establish and maintain forest information, monitoring, reporting and verification mechanism with well-equipped Forest Management Information Systems.

In one hand the forestry sector is often undervalued and under-represented in policy-making processes, in other hand a cost effective, robust, and transparent national monitoring and MRV system that provides credible measurement, reporting and verification are the most important elements to accrue benefits from REDD+ initiatives. The lack of clear data and data analysis has remained a serious challenge in forestry sector. So, a National Forest Information Management System (NAFIMS) and a national MRV system need to be established in order to carry out the major functions of monitoring, measurement, evaluation and reporting effectively.

Major Strategic actions:

13.1 Increase access to information on forest resources including decisions, plans, policies, programs and budgets, audit reports etc.

13.2 Enhance the national capability to conduct forest resource survey and inventory periodically and make data available for specific physiographic and administrative regions.

13.3 Develop the capacity for data collection, analysis, storage, management and dissemination for the national/local planning, and policy development.

13.4 Establish and make functional a forest management information system at different levels

13.5 Establish cost effective mechanisms for monitoring, reporting and verification of land use changes (and their impacts on commitments to achieving emissions reduction and enhancement at sub-regional/jurisdictional and national level)

13.6 Identify monitoring indicators and establish community-monitoring systems in all community based management regimes and include them in their operational/management plans.

2.5.2 Feasibility assessment of selected strategy options and the risk mitigation measures

For each of the Strategies a review is made below of the strengths, weaknesses/risks and the mitigation measures and/or options to reduce the weaknesses and/or risks. In section 2.9 a review is made of the specific social and environmental impacts of the strategies.

Strategic # 1

Enhance carbon stocks, increase supply of forest products, and reduce carbon emission through sustainable management of forests, land rehabilitation, shrubland management, and addressing DD in all management regimes.

1.1 Strengths

Many new initiatives in the Ministry of Forests and Soil Conservation (MFSC) including formulation of new strategy for the forestry sector and new forestry act can be regarded as major strengths which are aimed at meeting the gaps experienced in the areas of forest conservation, utilization and better management. The implementation of new acts, policies, rules and regulations in related sectors since last few years in areas such as land use planning, energy and water resources development, climate change and environmental protection, among others, will lead to implement mitigation and adaptation measures simultaneously and effectively. These are at the same time consistent with the development priority and direction of the government in which the focus is on inclusive growth and sustainable development. As an offshoot, the current plan gives highest priority to the forestry development, conservation and environmental programs. The functional highest apex body at the Ministry of Forests and Soil Conservation with due representation from different related ministries and other stakeholders and similar institutional arrangements at the sub-regional and district level strengthen not only participatory process in decision making but also enhance the scope of improved coordination. The formation of higher level body explicitly to address the deforestation problem in Churia area exemplifies the commitment at the highest political level. Gradual overcoming from long political transition also will enhance enforcement capability of the state and government to be instrumental for the implementation of REDD+ successfully. The involvement of stakeholders and right holders at various levels both vertically and horizontally with added thrust on community forestry is expected to contribute a process of forest conservation and utilization more judiciously. More robust benefit sharing arrangement among community forestry user groups and forest dependent people added by incentive through carbon trust fund based on performance criteria is expected to enhance the implementation of REDD+ strategy.

1.2 Major Weaknesses/Risks

A closer assessment indicates that still the downside risks in many fronts are high. First of all, a country which is aiming at graduating from least to developing country by 2022 with ambition of accomplishing about 9 percent growth rate per annum demands massive investment in infrastructure, services and key production sectors like agriculture and industry. A massive investment program in energy development is going on with many mega water resources projects in the implementation pipeline. On the other hand, the ratio of forest dependent people is still very high and hence if net gains are expected very little, people may resist enforcement of forest conservation program which may get politicized as the issue is associated with livelihood of the people in general and adjoining forest area indigenous people in particular. This means, if forest-dwelling communities do not have their strong say in the REDD contract negotiations; this may create tensions at local level with added implementation problem. In general, people may continue to clear the forest illegally for agriculture purposes on the opportunity cost consideration. The rapid urbanization, land encroachment and policy of resettlement may add the risk. Given the open border, controlling of illegal clearing of forests and illicit felling of timber for smuggling across the border may continuously remain a challenging task. The different pricing system for different timbers, poor transparent and compliance practices continue to add risk.

There are also perceived many problems of technical in nature. Assessment of the potential of carbon sequestration by different forest types and management systems is a difficult task. Still ambiguity in the tenure system under different forest types is there. Needless to add that both aboveground tree biomass and belowground root biomass requires robust assessment to understand forest carbon dynamics. Moreover, problem of predicting REDD market due to technical complexities and high implementation costs may create insecurity of and tenure for the forest-dependent communities leading to inequality in benefit-sharing.

Above all, the cloud of political uncertainty and prolonged transition is there with high risk as this may continuously pose problems of enforcing rules and regulations and implementing programs effectively by the ministries and their wings at different level. Worryingly many policies like land use planning which classifies land more scientifically and can be a strong means of controlling deforestation and forest degradation are yet to be implemented effectively. Necessary steps to streamline the contradictory provisions in various acts with those of forestry are yet to be taken. Therefore, problem of overlaps, coordination among ministries and enhancement of compliance through better transparent and accountable system may remain a big challenge. The problem of highly qualified and competent manpower amidst a tendency of over politicization of bureaucracy may pose added problem in an unstable political environment.

1.3 Mitigating Measures/Options

First of all, there is a need of linking of forest and ecosystem services conservation as well as environmental protection related policies and programs more candidly with sustainable development agenda which despite highest priority in the development plans and programs still lack establishing adequate linkages. The reforms are essential from the project and program preparation level in which major related elements need incorporation more explicitly for making the review and monitoring system effective and accountable both institutionally and individually.

Similarly, in place of numerous acts there is a need of a unified act related to natural resource management for clarity on institutional responsibility, filling gaps, removing contradictory provisions in various acts, enhancing coordination and ensuring compliance of ministries and other different level institutional wings. Alternatively, removal of contradictory provisions in various laws, filling of gaps in act and policy and bringing effectiveness in intra and inter-sectoral coordination will be essential. In the reform process, a system that enhances transparency and accountability at different levels has to be ensured.

Similarly, an autonomous body to deal with carbon registration, fixation of reference level and measurement of carbon stock enhancement, financial mechanism and use of carbon funds may be required. In view of carbon trading being a long term program associated with income, revenue, benefit sharing, incentive and de-incentive to carbon stock enhancement, such a body may be more effective. Alternatively, more autonomy to the REDD Implementation Center will be essential to deal with various complicated and challenging issues. For prompt actions and effectiveness the institutional and human resource capability will need enhancement considerably.

Various stake and right holders are still unaware about REDD+ with sometime wrong message and impression. Therefore, as a coping and risk mitigating strategy, an awareness campaign has to be stepped up to the grass root levels more effectively. It is clear that REDD+ compensation outweighs the revenue from other land uses. This has to be disseminated widely. Successful participation of stake and right holders can bring ecological and economic benefits to the community as well as the country.

As studies indicate, there is a high potential for Nepal to benefit from the REDD mechanism by expanding the community forestry program and bringing the regime under the REDD mechanism. For this, however, elite captured and mismanagement practices at the community level have to be addressed with priority.

The five major interventions identified in the ER-Program will need implementation effectively which focuses most pressing issues associated with supply and conserving of forests, enhancement of carbon stocks, improvement in forest law enforcement and governance system, expansion of alternative energy, enforcement of integrated land use planning , engagement of private sector in sustainable production and value chain of forest products and enhancement of alternative livelihood opportunities to address underlying drivers.

As an integral part, programs like reclaiming and restoring encroached forestlands and controlling further encroachment, optimal and sustainable financing for forestry research and development, capacity enhancement of user groups and government forestry staff, controlling overgrazing, and introducing participatory land use evaluation and land use planning system should be perused vigorously in a much more coordinated manner.

Strategic # 2

Promote adaptive ecosystem-based approaches and integrated watershed management to conserve biodiversity and enhance the integrity of ecological systems across the landscapes.

2.1 Strengths

For the conservation of biodiversity and ecosystem a number of legal and policy measures have been prepared and implemented. The conservation policies have taken certain paradigmatic shift from 'people exclusionary' and 'species focused' to ' people-centered community based' and 'ecosystem/landscape approach' in the past two decades. The National and Local Adaptation Program of Actions have recognized the need for immediate actions to minimize climate risks to society, economy and ecosystems. Attempts are there to link conservation with development and redistribute park revenue to local communities, and transfer more rights and responsibilities to the institutions of local people through buffer zone program and conservation areas approach. All these add both political and institutional strengths.

2.2 Weaknesses/ Risks

The ecosystem services are still undervalued or less prioritized. For instance, despite existing policies highlighting about forest ecosystem services, the subsequent legislations (Acts and regulations) are silent about the services generated from forest ecosystems such as water and carbon whether they are forest products or simply a ecosystem services. This limits the scope of promoting adaptive ecosystem services approaches and integrating watershed management to conserve biodiversity.

2.3 Mitigating Measures/Options

There is a need of reforms in the existing legislations to meet the above lapses. At the same time, a better understanding at both political and bureaucratic level on the need of enhancing ecosystem services for effective conservation, resilient livelihoods and speedy poverty reduction is required. Awareness campaigns at grass root level through local level non-governmental organizations will also be effective for understanding and better results. Development and promotion of Payment for Environmental Services (PES) for reduced emissions, watershed management, biodiversity conservation and sustainable agriculture interventions is equally necessary.

Strategic # 3

Promote private and public land forestry with appropriate financial incentives, simplified regulatory provisions and technical support mechanisms to create new forests.

3.1 Strengths

Nepal is now in the process of reforming many old acts and bring about new ones to remove various legal and institutional constraints that are hindering enabling environment to the private sector. Dozens of acts are now in the legislative parliament for the review and enactment. Amidst such moves, government is encouraging leasehold forestry and also there is growing realizing to promote forestry in the private sector. With the REDD+ providing incentives to carbon trading, promotion to the private land forestry through various incentive schemes such as more friendly regulatory provisions, financial incentives and technical support is expected to augment with gradual changes in forest ownership structure, allocation of land for different tenure regimes, and management system. This will encourage creating new forests based on the scarcity value of products leading to improved efficiency in the forest management as well.

3.2 Weaknesses/ Risks

No major ownership structure is expected soon that could help divesting state forest to the private sector. Also there are problems to smooth handover of government managed forest to community forestry. The existing royalty and price-setting mechanisms is equally defective and hence the incentives facing forest resource users do not correspond to real economic scarcities. The undervaluation of resources promotes illegal trade and use of existing stocks excessively. Hence, regulatory mechanisms that could supplement market signals also do not appropriately reflect resource scarcity or encourage an adequate level of resource management. Regulatory inefficiencies, little incentive structures and low priority to technical capability enhancement add financial and other burdens to government as well as community forests leading to disincentive to expand new forest. There is hardly any special financial support through banking and financial institutions.

3.3 Mitigating Measures/Options

There is a need of gradual changes in forest ownership structure with additional incentives to the private sector. This will require preparedness at the highest political level for a breakthrough. Apart from reform in pricing system that could reflect scarcity value of products, other direct incentives including tax and especial banking credit support policies and policies granting technical support will be required to create a level playing field for different tenure regimes for encouragement toward new forests. In particular, for the promotion to the private forestry, simplifying in administrative and procedural process added by tax incentives will be required. Special support and facilities to the nursery and plantation of indigenous and fast growing tree species with seed, seedling, research technologies and information (on growth and yield) facilities will help to promote private forest. Special financial support schemes to the private tree growers and forestry entrepreneurs will be required. Due attention to promote forestry on community abandoned land including flood plains, river banks within and outside forest areas with plantation, natural regeneration and other appropriate interventions with people's participation particularly, poor and marginalized households (Tarai) will be equally necessary.

Strategic # 4

Improve land uses across the physiographic regions (Tarai, Siwalik, Mid-Hills and Mountains)

4.1 Strength

There is strong commitment of the government to implement new land use planning policy effectively which categorises land based on the use criteria in which the ecological, landscape and possible best alternative uses has been given due consideration. The new agriculture sector development strategy also gives highest priority for the best alternative use of land based on landscape and ecological diversity and sticks to the policy of maintaining at least 40 percent of land under forest cover.

4.2 Weaknesses/ Risks

The major problem is that the policy is yet to be implemented effectively. The encroachment of fertile land and forest area is continuing. The poor urban planning and widening of real estate business in urban and semi-urban areas haphazardly, stagnation in productivity in agriculture encouraging expanded farming through encroachment of land amidst lack of alternatives to land dependent people are real problems. Moreover, frequent announcement of resettlement program that too without adherence to the time bound principles followed by selection, dissolution and reselection of resettlement committees in frequent time intervals based on political leanings amidst prolonged political transition is also a bigger problem for the use of land properly. Lack of coherency or contradiction between the land use policy and other policies and acts also hinder a process of improvement in the land use for maximizing benefits. The absence of forest land use classification in terms of productivity, sensitivity, accessibility, disaster hazard, and climate change vulnerability is also a problem particularly in Tarai, Churia and High mountain areas.

4.3 Mitigating Measures/Options

Strict follow and compliance to the new land use policy and abolishing of conflicting clauses prevalent in different other policies and acts will be essential which, in turn, demand sincerity and commitments at the highest political level. Further reclassification of land in terms of such as productivity and climate change vulnerability will also be necessary. Various initiatives like establishment of spatially explicit information systems on land use pattern, zoning of forest, community based approach in High Mountain and Churia areas and Climate Change Vulnerability Assessment of forests, adaptation of GIS and remote-sensing/spatial planning system and controlling of haphazard mining and excavation have to be taken with priority.

Strategic # 5

Clarify forest tenure, ensure carbon rights and fair benefit sharing among various right holders

4.3 Strengths

One of the positive developments during the ongoing preparation for REDD+ implementation is that the ambiguity or absence of clarity on tenure system, conflict of interest and problems associated with fair benefit sharing among various holders have been clearly identified followed by new initiatives or proposals to address such problems through correcting in acts, policies and programs. Many institutional reform moves or plans are also driven by the same objective.

4.4 Weaknesses/ Risks

The biggest threat or risk is that all the process is very slow and time consuming. At the same time, because of conflict of interest at different stakeholders level and need of multi-sector coordination and common understanding required time bound prompt action may be a problem.

4.5 Mitigating Measures/Options

Time bound implementation of suggested measures or steps are warranted. In view of clarity and fair benefit sharing being prerequisite for the successful implementation of the REDD+. it is essential to legally define the tenure security of forest users and clarifying their carbon rights. There is also a need of legally defined mechanism for the sharing of carbon, non-carbon benefits and payment of environmental services among right holders.

Strategic # 6

Promote forestry and non- forestry enterprise development and enhance livelihood options and employment opportunities for forest dependent poor and marginalized communities.

6.1 Strengths

Promotion to the forestry and non-forestry enterprise development and enhance livelihood options and promote employment opportunities is the major ingredient of inclusive growth and development strategy that Nepal is pursuing today. The agriculture and forestry development policies reinforce such a strategy. The micro and small enterprise development policy provides various tax rebates and facilities. The monetary policy also gives special priority to such enterprises through a priority sector lending policy in which concession loan facilities and interest rate rebates are offered. The REDD+ priority will give additional impetus toward that direction.

6.2 Weaknesses/ Risks

The major problem with the ongoing policies and programs is that they are too much diverse and at the same time different institutions implement them in their one way. There is also very poor compliance mechanism that could contribute to address the problems as and when emerge or aggravate. The added problem is that with more open up and liberal policy environment leading to stiff competition from the imported cheap goods, a discouraging environment is manifesting to such enterprises with added survival problems. Consequently, the problem of productive employment and livelihood has become a real challenge to the poor and marginalized people. In such circumstances, any strict measures to displace forest dependent people from the adjoining forest area without alternative employment opportunities could augment rather than ease their livelihood problem. This may erode the expected support for the REDD+ implementation, adding problems toward mobilizing political support at the grass roots.

6.2 Mitigating Measures/Options

A separate and more distinct policy targeting to the forest dependent people with separate institutional support system will be essential for promoting forest and non-forest enterprises in their vicinity based on the viability in the particular location. In the areas where such people or communities reside, encouragement to establish and run production organizations has to be given with adequate incentive structures. Modules should be developed and implemented which could operate under value chain framework in which both input and output marketing responsibility is performed by community based production organizations for, at the same time, ensuring the checking of increased exploitation by the middlemen and brokers. Capacity enhancement in areas like maintenance of detailed resource inventory, knowledge and skills about modern technology and product quality, mobilization of funds, system of collecting market related information and disseminating to the members regularly should be an integral part of such a new policy and institutional development approach.

7 Strategic # 7

Increase agricultural productivity for small and marginal farmers by providing sustained supply of inputs for agriculture intensification and contribute to food security

7.1 Strength

One of the positive aspects of the new agriculture development strategy is that it gives highest priority to enhance productivity in the small and marginal farms. Crop diversification and commercialization through improved extension services including access to market is prioritized there as a means of increasing productivity and encouraging cropping intensity for improved food security. In recent years, there is added thrust and priority to the agriculture sector development by the government with considerable increment in budgetary allocations. Importantly, food sovereignty is recognized as one of the fundamental rights of the people in the Interim Constitution. These provide additional space and support to the REDD+ strategy in this area.

7.2 Weaknesses/Risks

The fragmentation of land, lack of effectiveness in providing extension services in time bound manner and absence of reliable market to the small and poor farmers in obtaining inputs and selling their very limited products amidst increased exploitation by the brokers and middlemen is the biggest problem faced by the poor and small farmers. Lack of year round irrigation facility and access to improved production techniques, high subsidy in the neighboring country and continued very low or declining productivity are particularly the serious challenges. While emphasizing productivity, there is also risk of increased agricultural greenhouse gas emissions.

7.3 Mitigating Measures/Options

There is a need of sincere implementation of new agriculture development strategy ensuring effectiveness through mechanisms that enhance compliance which will also need better coordination. Intensification of climate smart species and technology for agro-forestry, organic farming, and use of alternative sources of fertilizer needs priority. Support to the application of Sloping Agriculture Land Technologies (contours with fodder trees/grasses in bari lands) including water source protection and support for water harvesting technology, priority to increase fodder and forage production in community based forestry and increased access to crop & livestock breeding and husbandry improvement programs will be necessary.

8 Strategic # 8

Increase access to affordable and efficient technology of alternative wood and energy.

8.1 Strengths

The energy is a high priority of the government with focus on both water resources and other alternative energies development. Approval to the mega electricity projects in a fast track basis and encouragement to the domestic investors to harness micro and small scale water resources projects in parallel is expected to augment energy supply to overcome the huge demand gap in the foreseeable future. Government is also expanding alternative energy development program in the rural areas through subsidy to biogas plants in

addition to promoting different fuel wood efficiency programs. These are expected to gradually ease the pressure on excessive use of forestry for firewood and other purposes.

8.2 Weaknesses/ Risks

Still the uncertainty to meet energy supply and demand gap is persisting. At the same time, the alternative energy program is in the slow speed with limited extension each year. Drastic reduction in the use of firewood will not be possible. It will also be affected by the extent of alternative income and employment opportunities to the forest dependent people. There is also added risk of leakages and poor regulatory system in both government and community managed forests.

8.3 Mitigating Measures/Options

There is a need of timely implementation of energy projects which are under construction or have obtained approval in a fast track basis. There is also a necessity of augmentation of alternative development program in the rural areas taking affordability into especial consideration which demands more targeted approach among forest dependent poor people that use firewood excessively for multiple purposes. Fuel efficiency program also needs more focus and extension. Better coordination among different agencies should be high priority for all new or extended initiatives.

Strategic # 9

Develop synergy among various sectors, sectoral policies and legal frameworks for a shared understanding and collective efforts for climate change mitigation and adaptation.

9.1 Strengths

As a part of REDD+ preparation, there is growing realization on the need of synergies among various sectors including coherency among various policies and legal frameworks. The highest apex body representing various ministries and similar institutional arrangements at sub-national and district level is the outcome of such a realization. Understanding to pursue mitigation and adaptation measures simultaneously is also expected to enhance synergies and better coordination among sectors. .

8.2 Weaknesses/ Risks

The conflicting acts and policies followed by coordination has been a major problem. Unless commitments are made to resolve cross-sectoral conflicts at central, regional and district levels through the mechanism envisaged under REDD+ and other parallel coordinating mechanism the risk will persist.

8.3 Mitigation Measures/Options

There is a need of identification and addressing of contradictory issues inherent in cross-sectoral policies and legal frameworks. This has to be accompanied by improved coordination among sectors like forest, soil and water conservation, land reform, agriculture, local development, energy, and physical planning and water resources development. An integrated approach in planning, policy making, project design, implementation, monitoring and evaluations of projects and programs will be required as a part of consensus-building process for synergies, harmonization and coordination at various layers of different sectors.

Strategic # 10

Strengthen institutional performance and service delivery system through institutional reform, capability enhancement, good governance practices.

10.1 Strengths

Along with increased liberty of deprived and deepening of democratic practices with increased focus on participatory and inclusive system, civil society and community organizations have expanded phenomenally. Numerous forest organizations have come up from the grass roots. A vibrant media has also emerged and expanded. Many governance and awareness campaigning organizations are working at different levels. Government through continued various institutional reforms is engaged in improving delivery and governance system. Reforms are underway in the Ministry of Forest and Soil Conservation with various new REDD+ preparations.

10. 2 Weaknesses/ Risks

The governance system is still very weak in the forest sector which is partly affected by conflicting clauses of laws and weak enforcement leading to many distortions, inefficiencies, and leakages with opportunities for corruption and abuses. This has resulted in distrust among stake and right holders. The over politicization of bureaucracy and a culture of corrupt practices pose challenges for improved governance and delivery, a prerequisite for successful REDD+ implementation.

10.3 Mitigation Measures/Options

A transparent and accountable system at different levels is a must. This gain calls for full commitment at the highest political level. There is a need of assurance to the stakeholders and right holders that a fair, legitimate, and predictable system is promoted as a part of REDD+ implementation to enhance trust, confidence, participation, and equity. Reward and punishment system has to be implemented effectively in the bureaucratic structure. The users groups and forestry organizations should be encouraged to work as whistle-blowers to check illegal practices. Review and updating of judiciary and judicial processes to strengthen forest law enforcement system for controlling illegal harvest and helping to promote trading of forest products in a fair and transparent is necessary. There is also a need of promoting and establishing decentralized and accountable multi-stakeholder forest governance structures added by strengthening the role and involvement of multi-stakeholder forums (such as DFSCC) at different levels. Similarly, adaptation of REDD+ international standards on participation, inclusion and Free, Prior, Informed Consent (FPIC) is required. Adequate representation of women, poor, indigenous people and socially marginalized groups in key forestry decision-making bodies and processes and recognition to the traditional and customary practices of forest management will also be required for enhancing governance and accountability based results and delivery.

Strategic # 11

Enhance technical, managerial and leadership capacity; groom and support champions of change and improve functional collaboration and cooperation among all stakeholders.

11.1 Strengths

Development of human resources has been a part of ongoing initiatives in the Ministry which consists of technical and managerial capacity enhancement through long and short term training. Both technical and leadership capacity in community managed forest is also continuing. With the REDD+ preparation process, there is a priority to enhance technical, managerial and leadership capacity of forestry staff and stakeholders associated with forest development and uses.

11.2 Weaknesses/ Risks

Weak technical, managerial and leadership capability is one of the biggest challenges for the successful implementation of REDD+. It demands high skills in certain technical aspects. For instance measurement of reference level, stock enhancement, pricing trends and system of trading requires depth understanding and updating in the related areas. The rules in the bureaucracy may be a major hurdle. In the community forestry also, capacity enhancement from the low level will be a major challenge. The political intervention may also add problems at different levels.

11.3 Mitigation Measures/Options

A comprehensive but robust policies and programs to enhance bureaucratic technical and managerial capacity is a must. Based on a priory assessment on the need of various types of technical and managerial personnel, overall human resources development program has to be launched in a time bound manner. Capacity enhancement of concerned stakeholders and community user groups should form the part and parcel of comprehensive program. The specialized humanpower should be in a position to work in a long term basis without frequent transfers from one place to another. This will, among others, require more autonomy of institutions working in the REDD+ implementation which will require absence of political interference.

Strategic # 12

Promote forest and climate-friendly infrastructure planning, construction and maintenance - ensuring that location and applied technologies minimize both direct and indirect impacts on forest.

12.1 Strengths

With increased soil erosion, river cutting in a massive scale and manifestation of disaster problem across different parts of the country, there is growing realization on the need of promoting forest and climate friendly infrastructure development. Now concerned ministries, departments and various stakeholders are expediting initiatives and measures through reforms in rules, policies and programs. More stringent clauses are being pushed to prevent adverse environmental and climatic effect from construction works. The REDD+ preparation process has additionally contributed to that process.

12.2 Weaknesses/ Risks

Notwithstanding many initiatives, still infrastructure development including road expansion, energy development and irrigation related construction works give little attention to the forest and climate friendly system. Building of schools, health offices and piped water development programs also no attention to the climate and forest friendly system is given. The networking or expanding of local roads are preferring forest land. Ambiguity and conflict in various sectoral policies and laws are aggravating such problems.

12.3 Mitigation Measures/Options

First of all there is need of coherency in acts and policies for ensuring that forest and climate friendly infrastructure development or construction programs are implemented. Policies encouraging forest friendly technologies will be required. At the same time, effective coordination between forestry sector and other development sectors will be required at different levels. Ensuring of sustainability of infrastructure (hydropower, transmission lines, highways, rural roads, irrigation canals, railways etc) development and maintenance by considering environmental, social and economic aspects is particularly essential.

Implementation of IEE and EIA is a must. Likewise, avoidance of forest area for infrastructure development and compulsory provision of tree planting to substitute forest cleared is required.

Strategic # 13

Establish and maintain forest information, monitoring, reporting and verification mechanism with well-equipped Forest Management Information Systems.

12.1 Strengths

Establishment of proposed National Forest Information Management System (NAFIMS) grounded on a new integrated GIS based Forest Information System will be a big step to strengthen fact based decisions in various stages of REDD+ implementation in different fronts and areas. This will help to gauge the contribution of forestry sector in the national economy which is underreported and will be an important means of cost effective, robust, and transparent national monitoring and MRV system for credible measurement, reporting and verification, a prerequisite to derive benefits from REDD+ initiatives. This will enhance transparent system, a prerequisite for strengthening accountability system.

13.2 Weaknesses/Risks

The initiatives will require serious ground work at the beginning in all forest regimes to develop techniques that allow collection of reliable information. Both existing technical capacity and incentive structure is less helpful in this regard. Unless what data and for what purposes is clearly understood, the wrong or under reporting will be a major problem. The illegal logging, existing timber pricing system and poor reporting on pre and post-harvest inventory etc may complicate strengthening data collection and information management system.

12.2 Mitigation Measures/Options

There is a need of developing certain benchmark in the beginning to identify the key areas in which daily collection of data will be essential. A system of conducting forest resource survey and inventory periodically as per ecological region and administrative units has to be an integral part of strengthening data base system. The institutional capacity enhancement at all forest tenure regimes will be essential and pre-requisite. This will need commitment and initiatives at the highest political level as it gradually contributes to replace the adhoc system.

2.5.3 Action Plan for the implementation of strategies

As discussed in section 2.1.7 the REDD+ implementation will take place in three phases of readiness, more advanced readiness, and compliance. The implementation of the REDD+ strategy will begin in the more advanced readiness phase probably starting in 2015. This plan of action is developed as a way forward to implement the REDD+ strategy during the more advanced readiness phase (Table 18).

Table 18. Proposed plan of action

SN	Actions	Year 1	Year 2	Year 3	Year 4	Year 5
1.	Approval of the strategy document					
2.	Develop Monitoring and Evaluation framework of REDD+ Strategy					
3.	Develop implementation plan of strategy with detailed budget and action plans/programs					
4.	Update of SESA according to the REDD+strategy					
5.	Policy and legal framework update and harmonization					
6.	Researches, studies and knowledge generations					
7.	Awareness raising and capacity development on REDD+ of all stakeholders					
8.	Institutional set up for REDD+ implementation, safeguards, GRM and provision of human resources					
9.	Establishment and management of functional MRV and NAFMIS					
10.	Coordination, collaboration and communication with different sectors and stakeholders					
11.	Review and evaluation					

2.6 REDD+ Implementation framework

2.6.1 Institutional, Economic and Governance Arrangements

2.6.1.1 Institutional Structure (for the implementation of REDD+ strategy/program)

The institutional structure for the implementation of REDD+ strategies and programs will be based on existing government institution and using already approved institution where possible. The key elements of these structures will be covering policy, a coordination and steering entity, a MRV system entity and a benefit sharing mechanism entity, all operational from center to sub-national and district levels for the 3Is: *incentives*, *information* and *institutions*[29]. *Incentives* for the performance-based payments and changes in policies; reliable *information* about the changes in forest carbon stocks to qualify for international funds; and, effective

[29] Institutions are conventions, norms and/or legal rules that form the actors and regulate the relationships between them (Scott 1995; Vatn 2005).

institution to manage information and incentives (Wertz-Kanounnikoff and Angelsen, 2009).

The responsibilities of the proposed REDD+ institutions will be to:

i) set policy direction, coordinate and steer/manage REDD+ programs.

ii) manage the flow of information among different entities and stakeholders including information on changes in forest carbon stocks.

iii) manage the flow of incentives to carbon rights holders.

For the effective, efficient and transparent functioning of the REDD+ institutions, R-PP, ERPIN of Nepal's TAL and the institutional assessment by REDD Cell (2014) have emphasized on the followings:

- Using the existing forest institutional structures and arrangements as far as possible.
- Involving multi-stakeholders at different level so that they can effectively participate in, contribute to and benefit from program activities.
- Enhancing capacity and ensuring equitable representation of local forest user groups, civil society groups, relevant government departments, forest dependent people, indigenous people, local communities, women, and *Dalits* at appropriate levels.
- Ensuring the REDD+ information on measurement and reporting is readily available at all levels and to all actors, and relevant data is generated through periodic monitoring of forests, through a tested and institutionalized internal verification system by MRV implementing agency.
- Ensuring that local stakeholders and forest managers in all forest management regimes (CF, CoFM, government managed forests, protection forests, and PAs) participate and engage in field based monitoring.
- Ensuring the REDD relevant data is generated through periodic monitoring of forests, through a tested and institutionalized internal verification system by the MRV implementing agency (the DFRS).

Based on the above emphasis, existing practices of REDD+ preparation, various consulting works/studies and consultations with various stakeholders, the REDD+ strategy proposes the institutional structure as in Figure 9 and Figure 10 that comprise a three-tiered structure of national level, regional level and district/local level. The structure and function of these institutions will be reviewed and updated at a periodic basis during the implementation of the strategy.

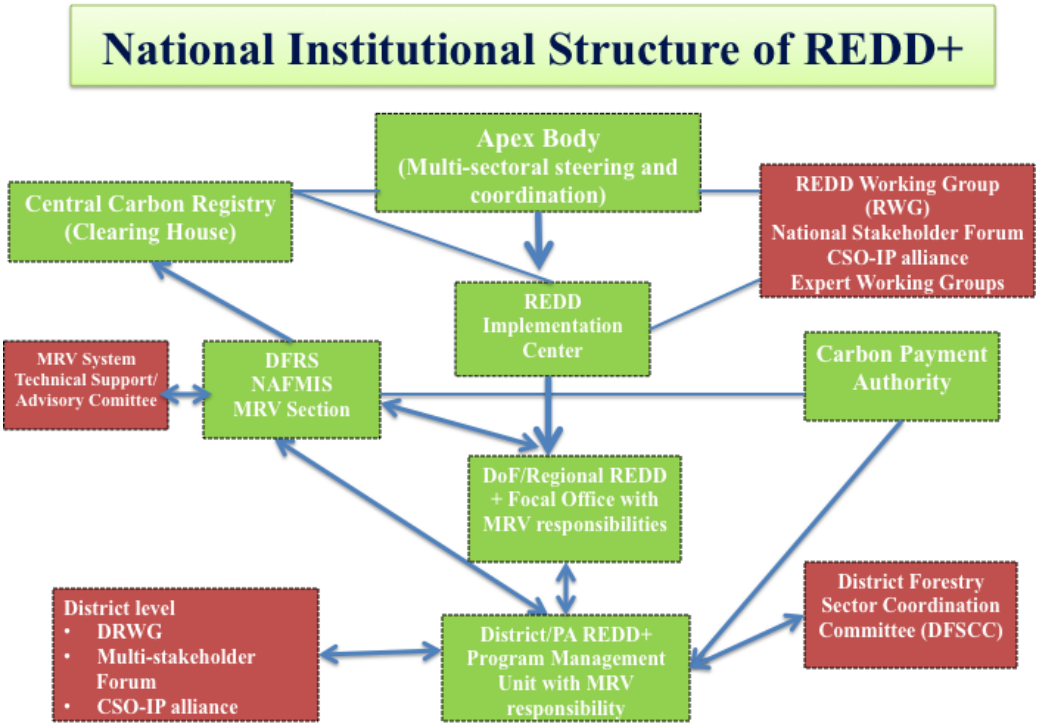

Figure 9. National REDD+ Institutional structure

(Adapted after REDD Cell, 2014)

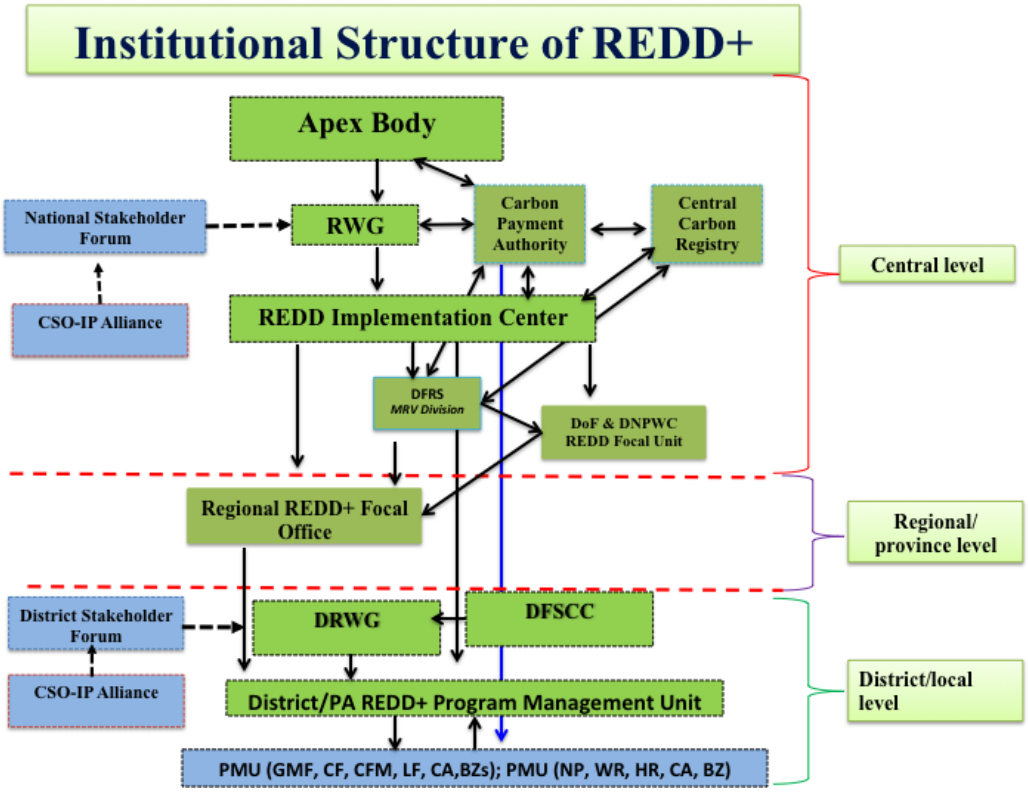

Figure 10. REDD+ Institutional structure from central to local level

(Based on REDD Cell, 2014 and consultations)

National REDD+ Institutional structure

a) REDD+ Apex body:

The REDD+ Apex body for an inter-ministerial high level policy steering and coordination entity chaired by the Minister of the Ministry of Forests and Soil Conservation is already functional during REDD+ preparation. The Apex body will meet two times a year and will promote collaboration and cooperation among different sectors and stakeholders and harmonize REDD+ related policies and programs. The 49 member entity consists of other members from the Ministry of Finance, Ministry of Science, Technology and Environment, Ministry of Tourism and Civil Aviation, Ministry of Energy, Ministry of Agriculture Development, Ministry of Land Reform and Management, Ministry of Industry, Ministry of Federal Affairs and Local Development, Ministry of Physical Planning and Transport, and representatives from the private sector, civil society and government organizations.

b) REDD+ Working Group (RWG):

The RWG is formed from within REDD+ Multi-stakeholder forum chaired by the Secretary of MFSC. Currently the RWG comprises of 12 members represented by nine government and three non-government sectors. The RWG will be made further inclusive making it 15 members adding 3 members from non-government and academy. The RWG will give a strategic leadership to REDD+ Implementation Center by providing technical and institutional support, reviewing the progress, monitoring of program activities, integrating program priorities, and helping to create operational environment for smooth implementation of REDD+ strategy. RWG will meet at least once in every two months.

c) REDD+ Implementation Center (RIC):

Government of Nepal has recently approved the formation of REDD+ Implementation Center under the Ministry of Forests and Soil Conservation headed by Joint Secretary level staff of the ministry. The center will provide national leadership on REDD+ with responsibility for policy and program development, monitoring, reporting and verification, coordinating among different stakeholders and agencies, disseminating information, extension and capacity-building, and ensuring benefit sharing to right holders. The RIC works under the strategic direction of REDD+ Working Group and policy direction of Apex body. The government has also approved formation of four sections under RIC as: Climate Management Section, Remote Sensing and Land Information System Section, Budget and program section and Admin-finance section. The RIC will need to have a unit with the function of Environmental and Social Assessment and Monitoring.

d) REDD+ Multi-stakeholder Forum:

The REDD+ Multi-Stakeholder Forum will function as the principal outreach and communication platform. The forum includes representatives from the private sector, civil society, media, government organizations, community based organizations, local and international NGOs, donors, academia, research organizations and other stakeholders interested in REDD+. The forum will meet at least twice a year.

e) REDD+ CSO and IPO Alliance:

A platform of CSOs and IPOs working in forestry and REDD+ have formed a platform – REDD+ CSOs & IPOs Alliance, Nepal – to discuss and develop a common understanding on REDD+ on behalf of Civil Society Organizations and Indigenous Peoples Organizations. The main objective of the alliance is to advocate for developing justifiable REDD+ framework and mechanism in Nepal, and to empower and build capacity of CSOs and IPOs in the contemporary issues of REDD+. The alliance will be meet at least twice a year.

f) Central Carbon Registry (clearing house):

R-PP has proposed to create a central clearinghouse/carbon registry to work as a repository of REDD+ related information, allow for enforcement of standards and engage in carbon transaction by maintaining broad-based participation of stakeholders in the management of the registry. The institutional assessment for MRV (working paper # 3) has proposed the central carbon registry as an independent body in parallel with the Apex body represented by multi-sector/multi-level stakeholders with a separate secretariat. The detail functions, institutional arrangement and human resource needs of this entity will be explored during the process of REDD+ strategy implementation and appropriate measures will be taken.

g) Carbon Payment Authority:

A carbon payment authority is one of the important elements of REDD+ architecture for the payment of incentives from central down to sub-national and district/local levels. This entity needs to be linked with MRV section and central carbon registry responsible for tracking carbon benefit transactions from international to sub- national and local level according to the volume, location and type of emission reductions (REDD Cell, 2014, institutional assessment for MRV, WP# 3). RPP has made a proposal of Trust Fund, however the Ministry of Finance is not in favor of Trust Fund[30]. At this stage no firm recommendations are formulated as the design of the Financing Mechanism is currently be worked on by the UNDP under the UN-REDD Targeted Support Program.

h) DFRS-NAFMIS (MRV Division):

The Department of Forest Research and Survey will be the national MRV implementing agency as envisioned by the R-PP (further discussed in section 2.6.1.2 Institutional Framework for Measurement and MRV System)

i) REDD+ Focal Unit:

A REDD+ Focal Unit will be establish at the Department of Forest and Department of National Parks and Wildlife Conservation, which will liaise with the RIC, Regional REDD+ Focal Office and with DRPMU.

j) MRV System Technical Support/Advisory Committee:

A MRV System Technical Support/Advisory Committee will be formed to support for research, technology and capacity development and institutional strengthening of M and MRV. The objective is to maintain transparency in the functioning of M and MRV, and ensure relevant MRV stakeholders' and forest managers' perspective in the management, maintenance and strengthening of the MRV system on a regular and continued basis.

k) Experts Working Groups:

During the REDD+ preparation phase several expert working groups were formed to provide technical backstopping to the RWG such as expert working groups for REL/MRV, SESA/ESMF, and National REDD Strategy. Formation of such group will be continued as per the need.

Apart from above institutions, Government of Nepal has constituted the Climate Change Council chaired by Right Honorable Prime minister in July 2009. The chair of REDD + Apex Body is one of the members of the council. The council has mandate of providing guidance for the integration of climate change related aspects in the policies, plans and programs. The Apex body will be linked with this council to bring synergy and help

[30] Expressed by Mr Bhuvan Karki, Under Secretary of MoF during the consultation meeting.

address issues and challenges of conflicting policies and legal frameworks.

Regional level REDD+ Institutional structure

a) Regional REDD+ Focal Office (RRFO)

At each Regional Directorate Office (RDO) a Regional REDD+ Focal Office (RRFO) will be created. The RRFO will have another unit of Regional REDD+ MRV Unit (RRMU) for the function of MRV. The RRFO's main functions will be: 1) Coordinating for district REDD+ program implementation; 2) Providing advice and guidance to District REDD+ Program Management Unit; 3) Function as liaison with the RIC and RFU at DoF and DNPWC for technical guidance and advice; 4) Monitoring REDD+ implementation in the districts; 5) Reporting to the RIC and DoF/DNPWC; and, 6) Ensure MRV functions at regional/provincial level.

District level REDD+ Institutional structure

a) District Forestry Sector Coordination Committee (DFSCC):

The MFSC has issued a guideline to form DFSCC. The committee is chaired by DDC chair with representation of government line agencies; DDC, municipality and VDC associations; civil society (NGOs, Community Based Organizations and user groups); nationally recognized political parties at the district level; and the private sector (business federations and forest based industries). The DFSCC will monitor the implementation of REDD+ at district level and give policy and strategic direction.

b) District REDD Working Group (DRWG):

A 15- member DRWG representing district level government agencies, community based organizations, IP, women, and *Dalit* is proposed. The DRWG will be chaired by coordinator of agriculture, forestry and environment committee of the DDC. The DRWG will assist in the implementation of REDD+ program in the district, monitor program activities, and advocate and lobby to support for the emission reduction programs.

c) REDD+ Multi-stakeholder Forum and REDD+ CSO and IPO Alliance in district:

In each district, the REDD+ Multi-Stakeholder Forum and REDD+ CSO and IPO Alliance will be formed. They will function as the principal outreach and communication platform; advocate for implementing justifiable REDD+ program; and support to empower and build capacity of CSOs and IPOs in the district.

d) District/ Protected Area REDD+ Program Management Unit (DRPMU):

A District/PA REDD+ Program Management Unit will be established at the District Forest Office and Protected Areas where appropriate, which will be the lead institution to implement REDD+ activities in the district/PAs. The unit is responsible for coordinating the REDD+ implementation at the district/local level among diverse stakeholders and other ongoing programs, and will convene a DRWG meeting every two months. The unit will have a MRV section for the execution of the MRV functions at the district/local level; and an Environment and Social Section (ESC) to ascertain that the REDD+ Safeguards are taken into consideration during REDD+ implementation.

2.6.1.2 Institutional Framework for Monitoring and MRV System[31]:

Three tiers of MRV structural framework is proposed for MRV system governance. At central level, the Monitoring and MRV function will be included in the current survey division of the DFRS. At sub-national level, a REDD+ MRV unit will be established and the MRV section will be established at DFO/PA level. The central MRV section supervises and provides all technical/technological support, builds capacities and logistic support to sub-national MRV divisions. Similarly, sub-national MRV sections provide the technical oversight, guidance and capacity support to the DFOs/PAs and district/local MRV offices.

a) At Central level:

The Survey Division of DFRS will be reformed to 'Forest Survey and NAFMIS & MRV System Management Division' (will be referred as MRV Division) to ensure effective, efficient and transparent governance of measurement, monitoring and management of data under MRV system. An institutional structure for NAFMIS also needs to be worked out. With regard to Monitoring and MRV, the MRV Division of DFRS will be responsible for:

- Periodic execution of forest assessments for deforestation and degradation monitoring;
- Design, maintenance, and operation of National Forest Information Management System (NAFIMS) and dissemination through web portal;
- Providing technical guidance and institutional/capacity support to the parallel institutional setups at sub-national/district/local community levels.

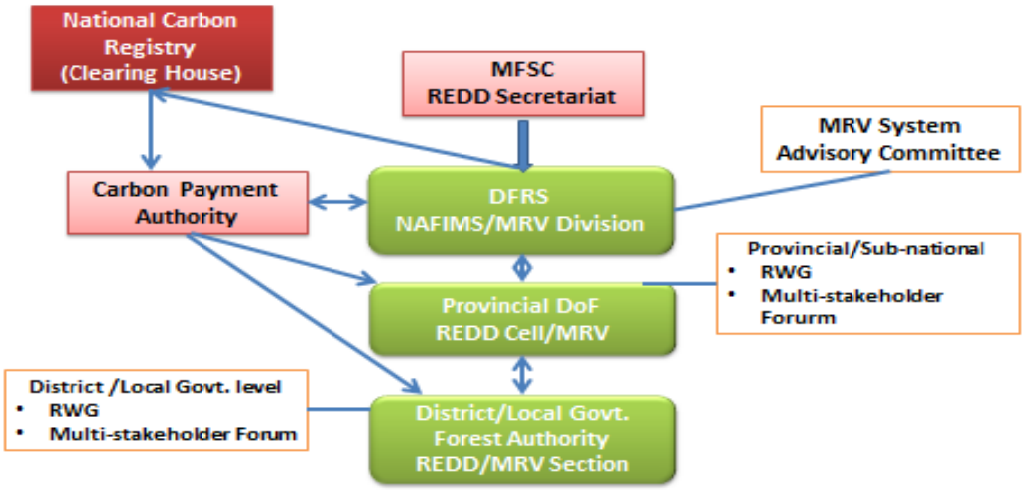

Figure 11. Proposed position of DFRS/NAFIMS/MRV Division
(Source: REDD Cell, 2014, institutional assessment for MRV, WP# 3)

The National Forest Information Management System (NAFIMS) presently being developed under Forest Resource Assessment (FRA) project of the DFRS will have MRV as one cabinet of a larger box. The proposed

[31] *Adapted from* working paper no 8- Nepal's MRV System Management Architecture: Structure, Functions Human Resources and Capacities; Emission Reductions Program Idea Note for Nepal's TAL; and RPP

position of MRV Division presented in Figure 11. This MRV Division will have dual reporting responsibility to DFRS and REDD Implementation Center and will get technical advice and assistance from an MRV System Advisory Committee. At the national level the MRV Division will be linked with the National Carbon Registry and the Carbon Payment Authority. Within the MRV Division apart from other sections, there will be four interconnected units as depicted in Figure 12. The verification and reporting unit will verify and report the periodic carbon change and report to the Carbon Registry, and the independent verification will also be linked with the registry and the MRV division. The REDD and MRV sections at sub-national/provincial and district/local level will work to support the MRV system and function under the guidance of their respective RWGs and multi-stakeholder forums.

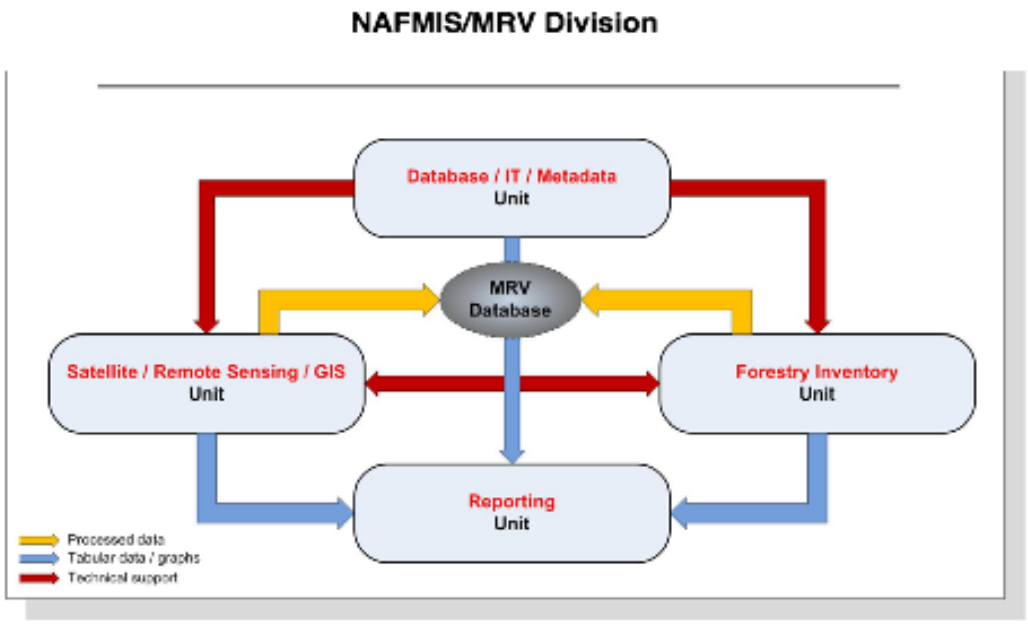

Figure 12. Units and their interaction within MRV Division

(Source: REDD Cell, 2014, institutional assessment for MRV, WP# 3)

As stated the NAFMIS/MRV division will have four units, namely:

i) Database/IT/Metadata Unit

ii) Remote Sensing/GIS Unit

iii) Forestry Inventory Unit

iv) Reporting Unit

i) Database/IT/Metadata Unit (DBIT): This is technically the core unit with a System Administrator and a Database Administrator. The DB Administrator will be responsible for managing and maintaining the MRV database structure (tables, relationships, keys) and assigning privileges and roles to different kind of users (public, editor, stakeholder, etc). The System Administrator will manage and maintain the IT web platform interface, server system, OS, firewalls, web services, connections, software update and Web Content

Management.

ii) The Remote Sensing / GIS Unit (RSGIS): The RSGIS Unit will be responsible for image processing and analysis to produce Land Use/Land Cover classification layers and perform GIS editing and analysis to ensure data integrity in the MRV database. It will undertake change detection in different forestry classes and categories using Multi-temporal satellite images, DEM and other ancillary data. Once LU/LC layers have been produced and validated, they will be uploaded into the MRV database. The Unit is also responsible for REL and WISDOM data entry and spatial data integration in the MRV system. The Unit will need six GIS/remote sensing experts and could also take technical support from DBIT and FORINV unit for specific tasks. The unit should also provide tabular data graph to the Reporting Unit periodically upon on request.

iii) The Forest Inventory Unit (FORINV): The FORINV Unit will responsible for forestry inventories nationally and coordinating inventories at sub-national and district/local level (also integrated by FRA Nepal data, if applicable) to estimate GHG emissions using very specific algorithms and models applied to local data collected by District/local unit. Once GHG estimates have been produced and validated, they will be loaded into the MRV database. The unit will require two forestry expert for the management of the unit and could get technical support from RSGIS and DBIT units.

iv) The Reporting Unit (REP): Reporting is a key element of MRV because it provides the means by which, the performance of the country will be assessed compared to its commitments or reference scenarios in a future REDD+ mechanism. Hence, it provides the basis for assigning incentives. This REP Unit is the unit for reporting, which provides periodic standard MRV reports (consistent with the reporting requirements outlined in the UNFCCC guidelines) for dissemination of aggregated data and information, collecting the necessary info by the other three units. The unit will require one REDD-MRV expert.

b) At Sub-National Level:

At sub-national level, a Regional REDD+ MRV Unit (RRMU) will be established under Regional REDD+ Focal Office (RRFO) at the regional forest office, which will coordinate with and guide the district /local level forestry institutions and also supervise and monitor their MRV related activities. The RRMU will be managed by a MRV coordinator (forestry expert) assisted by IT/monitoring expert skilled at operationalizing the MRV related database, and a capacity building expert. The unit will remain integrated with the national MRV system and provide policy and operational guidance for the implementation of MRV at district/local level. Its major technical functions will be i) coordination and implementation of forest inventory and field verification of GIS based forest maps produced from central MRV; ii) data processing and reporting to central MRV; ii) technical/capacity and other defined support to district/local levels.

c) At district/local level:

For MRV function at district/PA level, a District/PA MRV section (DMRVS) needs to be established under the District/PA REDD+ Program Management Unit of DFO with computer and internet-based database management arrangements. Forest carbon measurement data from all CBFM units and other FMUs participating in REDD+ will have to be validated by the DFO/PA authority, refined and entered in the database maintained at the district/PA level. In this section, two forestry technicians with additional knowledge and skills of IT and database maintenance/management and a computer operator skilled at data entry,

maintenance/management is needed.

2.6.1.3 Institutional Structure for Implementing Social and Environmental Safeguards:

The proposed institutional structures and mechanisms for safeguard implementation are based on the REDD+ ESMF (2014) and suggestions received from consultations with different stakeholders during the preparation of this strategy.

The implementation of the various safeguard measures - such as REDD+ project specific Environment Management Plan (EMPs,) and Social Action Plans (SAPs) that includes resettlement and rehabilitation plans (R&RP), IPs and vulnerable community development plans (IP&VCDP), and gender development plans (GDPs) - will need to be harmonized as an integrated part of the overall REDD + implementation arrangements. The safeguard implementation arrangements consist of institutional structures and responsibilities to minimize and mitigate social and environmental risks related to REDD+ strategy implementation.

At central level, an Environmental and Social Assessment and Monitoring Unit (ESAMU) will be established within the REDD+ Implementation Center (RIC), which will serve as the coordinating and implementing agency for REDD+ safeguards. The ESAMU will be responsible for the overall coordination, planning, implementation and monitoring of REDD+ safeguards activities as well as activities proposed under EMP, R&RP, IP&VCDP and GDP. Specifically ESAMU will have following responsibility:

- Screening of REDD+ project proposal at national level
- Liaison with MOSTE for ESIA procedure
- Liaison with other relevant ministry and institutions for implementation of EMP and SAP
- Monitoring and evaluation of implementation of safeguard measures as per EMP and SAP
- Act as Member Secretary to a Grievance Redressal Mechanism for national/regional REDD+ projects/activities, and facilitate the tabling of grievances by affected parties
- Collection and storage (database preparation) of safeguard related information,
- Disclosure and dissemination of safeguard related information through appropriate means of communication
- Preparation of status reports on safeguard implementation and monitoring periodically and submit to MFSC and donors through RIC

As a newly established structure, the RIC does not have any experience of managing social and environmental safeguard issues and also lacks appropriate human resources required for REDD+ safeguard implementation. The ESAMU will be staffed with two key experts (senior social safeguard specialist and senior environment specialist) having adequate experiences of safeguard planning, implementation and monitoring. Other support staff to assist the key experts will be deputed as and when required. The RIC/ESAMU will also require capacity support for enhancing social and environment management skills.

Regional REDD+ Focal Office (RRFO) at the regional forest office will have oversight and monitoring responsibilities over the respective District Forest Offices / or PA Offices/ or Protection Area (PA) offices and line agencies that will be implementing the REDD+ safeguard activities.

At district level, an Environment and Social Section (ESC) will be established in each District/PA REDD+ Program Management Unit (DRPMU) to handle environmental and social concerns. The ESC need to be strengthened with two key staff: one with environmental and another with social technical expertise to undertake environmental and social screening of proposals, implementation and monitoring of safeguard measures at district and protected area levels. Other key responsibilities of ESC in each district or protected area are

- Screening of sub-projects at district and local level
- Capacity building of local stakeholders
- Support/facilitate stakeholders
- Monitoring and evaluation
- Act as Member Secretary to a Grievance Redressal Mechanism for district and local REDD+ projects/activities, and facilitate the tabling of grievances by affected parties.
- Prepare status report on safeguard implementation and monitoring periodically and reporting to ESAMU
- Liaison with District REDD+ Working Group (DRWG)

At the local level, a REDD+ social and environment network (SEN) will be formed in each Village Development Committees (VDCs) having REDD+ projects. The SEF will be comprised of representative from VDC, Forest User Groups, farmer groups, IPs, Dalits, women and local community leaders. The SEN can play an important role in monitoring the implementation and outcomes of individual REDD+ projects. The other responsibilities of the SEN would be:

- Informing people of REDD+ programs and motivating local communities to develop projects (helping in proposal writing, including completing required environment and social screening information;
- Assisting and facilitating the subsequent process of environmental and social assessment when required;
- Undertaking environmental and social monitoring of REDD+ projects and verifying self-monitoring undertaken by project implementers.

In addition, the SEN can facilitate tabling grievances to the District-level grievance redress mechanism.

2.7 Legal / Institutional arrangements (for the implementation of the REDD+ strategy)

There is a need of redefining the role of the government through amendments to the Forests Act 1993 and Forest Regulation 1995. Both of them are under the assumption that the ownership of all forest land rests with the government and do not recognize or overlook the right of the forest users to carbon. Similarly, under the existing legal arrangements it is unclear whether carbon is a forest product or simply a byproduct of ecosystem services. For any carbon transaction to take place, and/or the sharing and delivering of benefits, legal clarity will be essential.

Due to different acts and by-laws, including institutional and benefit sharing modalities for diverse conservation areas, the benefit sharing mechanisms among conservation areas, buffer zone community forestry and other forms of community-based forestry outside protected area are different. However specific legal provisions and accompanying institutional arrangements on benefit sharing arrangement will be essential in future.

There is also a need of legal provision to ensure the customary use rights of the management practices of the indigenous communities, particularly in the high mountain areas. From the point of view of sustainable utilization of biological resources as well equitable sharing of the benefits, an unambiguous legal arrangement is required. In addition, a revisit to the National Parks and Wildlife Conservation related Acts and Regulations isalso necessary to clarify the rights of indigenous people, particularly the customary use rights and practices.

From the institutional perspectives, there is a need of creating a more enabling legal and institutional environment through review and amendment of forest and conservation related acts and regulations to make state forestry sector institutions competitive, decentralized, people-centric and downwardly accountable. For making all departments and district level organizations more service oriented, responsive, accountable and people-centered, ample devolution and delegation of authority will be required.

In this reform process, due attention has to be given to enhancing the participation, competency and leadership of women, indigenous and (other) poor and socially excluded groups and individuals in forestry sector institutions. New arrangements will have to ensure that an interaction among stakeholders and government agencies at different levels takes place for shared benefits and increased service delivery. One of the key ingredients for this is the enhancement of transparency, accountability and rule of law of all community-based forestry operations and management regimes. In the changed context, there is also a need to redefine the role the private sector in order to involve the private sector in the REDD+ transactions for enhancing carbon stocks and ensuring benefits.

2.8 Gaps remaining in the implementation framework

The implementation framework is broadly based on the assumption that the existing acts, regulations and policies will work more effectively under the REDD+ regime. This may not be the case as numerous problems in this area indicate. Therefore it will be judicious if initiatives on the need of a unified act related to natural resource management is made in which the focus should be on clarifying various institutional responsibilities, filling the gaps in acts, removing the contradicting provisions in various acts, enhancing intra and inter-sectoral coordination and ensuring compliance at all institutional levels. As a near term way out, initiatives to remove contradicting provisions in various laws, filling of gaps in the acts or policies and bringing about effectiveness in intra and inter-sectoral coordination for coherency and effectiveness in implementation can be taken.

Nepal's experience indicates that the kind of inter-ministerial coordination at the highest political level may not be there at this point in time at the required level, unless such a higher body is chaired by the Prime Minister. There are also other gaps that are found in the proposed structure. It can be observed that the representation of Dalits, women and private sector in the proposed structure is limited. Similarly, at the district level there are complaints of poor or lack of representation of right holders. This may create problems in the implementation. Similarly, the private sector representation seems to be overlooked despite its crucial

role from the inter-sectoral policy coordination and future carbon trading point of view, amongst other things. There are also complaints that the structure and working areas of DFSCC and the institutional structure of REDD+ that is being proposed to represent stakeholders gives little attention to the need of strengthening harmonized relations between the two.

It is also seen that no REDD+ fund management-related proposal has been made in the REDD+ institutional framework. Likewise, there is no clarity on how the coordination between the national Carbon Registry and the Carbon Payment Authority will be enhanced. In view of carbon registration, fixation of reference levels and measurement of carbon stock enhancement, financial mechanism and use of carbon funds are highly interrelated; an integrated institutional framework may be required for these areas. But it seems the proposed arrangement has given little attention to this. The proposed REDD Implementation Center being a division of the MFSC and/or a part of the government body may not be able to perform various complicated and challenging institutional responsibilities unless full autonomy - similar to Alternative Energy Centre or Poverty Alleviation Fund - is given to the center.

In relation to MRV, it is not entirely clear why different national and regional institutional frameworks have been proposed. It also seems that while proposing a Carbon Payment Authority, the R-PP proposed a Forest Carbon Trust Fund-related concept and such a Fund and other proposals do not seem to have been adequately considered.

Above all, for the REDD+ implementation a hybrid approach has been proposed which is challenging and difficult to implement.

2.9 Social and Environmental Impacts

This section discusses the possible impacts of each REDD+ strategy proposed in section 2.5 of this report and zooms in on social and environmental impacts, rather than the strength, weaknesses and risks of the options itself, as they are already reviewed in that same section 2.5.

As well known, the implementation of REDD+ strategies is not free from social and environmental risks. Some will be positive in line with the aims of the objectives of the strategies; other may not. However, as also well known, potentially REDD+ can bring much more than emissions reductions; a properly designed REDD+ mechanism is expected to contribute to multiple benefits. Depending on the location and type of REDD+ activity, these benefits potentially include poverty alleviation, recognition and enhancement of right of IPs and forest dependent communities, improved community livelihoods, technology transfer, sustainable use of forest resources and biodiversity conservation.

With particular reference to social impacts, and albeit that the potential benefits of REDD+ are numerous, there are serious concerns regarding how the REDD+ programs and projects will impact people and communities. Different stakeholder groups may experience different benefits and costs, i.e., some may benefit from REDD+ activities whereas others have to bear increased costs. These impacts have been identified by analyzing the findings of SESA, interpreting the key findings of the consultations held with stakeholders at different layers and experts' own judgment. Possible social and environmental impacts both positive and negative as a result of implementation of REDD+ strategies are considered.

Considering the significant dependence of local communities, indigenous people, women and other marginalized groups on the forest resources for their livelihoods and other daily needs, equitable and efficient distribution of payments from REDD+ credits among these groups and communities is the key challenge associated with REDD+ strategies implementation.

A summary of both positive and negative, social and environmental impacts likely to occur as result of implementation of each REDD+ strategy is presented in Table 19 below. All of the impacts can be cumulative and many of these may occur simultaneously from activities proposed in several strategies.

Table 19. Summary of social and environmental impacts of implementing REDD+ strategies

Strategy#1: Enhancing carbon stocks and reducing carbon emission	
Social impacts	
Positive	**Negative**
▪ Enhanced quality of life through multiple benefits ▪ Increased use of indigenous knowledge & ownership ▪ Increased supply of, access to, and value of forest products ▪ Reduced workload/drudgery in general and women in particular ▪ Enhanced capability of local communities	▪ Possibility of involuntary resettlement and eviction from unregistered land ▪ Liability risk if something goes wrong such as fire, storm, drought or other climate related or human related events and community might end up with more costs than benefits ▪ Risks of exposing local communities and indigenous peoples to international commodity markets under the influence of market-based mechanisms and threat to traditional biodiversity-related knowledge and customary knowledge of forest management.
Environmental impacts	
▪ Decreased carbon emissions / increased carbon sequestration/maintained carbon stocks ▪ Reduced deforestation and forest degradation and improved forest condition. ▪ Reduced effects of grazing and reduced lopping of fodder trees ▪ Reduced forest fire damage and reduced GHG emission	▪ Possibility of increasing mono-culture and associated environmental risk ▪ Control of grazing might result negative impacts on existing forest ecosystem where grazing have/had a positive role in maintaining their integrity. ▪ Reduced beneficial effect of fire such as improvement in soil and management of grassland ▪ Habitat and biodiversity loss due to forest management practices
Strategy #2: Conserving biodiversity enhancing the integrity of ecological systems	
Social impacts	
▪ Enhanced livelihood through improved biodiversity and environment services ▪ Increased environmental & social awareness ▪ Stakeholder engagement and participation leading to strengthening public institutions, transparency and promoting democratic processes	▪ Possible conflict, economic loss and destruction of traditional land tenure systems leading to eviction and loss or reduction of farm land/property ▪ Loss of traditional rights of access to and benefits from forest resources particularly forest dependent people ▪ Further marginalization and loss of livelihoods, income, economic opportunities to the poor and marginalized groups if participatory models not effective and elites capture the access and benefits
Environmental impacts	
▪ Improved ecosystem services ▪ Improved conservation of biodiversity & fragile ecosystems ▪ Enhanced biodiversity ▪ Removal of alien/invasive species ▪ Improved soil fertility / productivity / water retention ▪ Reduced land degradation / restored degraded	▪ Risk of focusing in the conservation of few particular species with adverse effect to other species

lands ▪ Reduced soil erosion, landslides, flooding ▪ Maintenance of watersheds / aquifers ▪ Enhanced scenic value / sense of place	
Strategy # 3: Promoting private and public land forestry	
Social impacts	
▪ Create alternative livelihood opportunities ▪ Removal of threats to livelihoods from forest degradation and secure access to forest resources ▪ Increased supplies of forest products, creating the potential to develop community-based cooperative enterprises ▪ Increased flow of forest products could lead to entrepreneurial development and generate revenue for the state	▪ Reduced food production due to expansion of private forestry in agricultural lands ▪ Risks of eviction for forest dependent marginalized communities including IPs, Dalits and Women ▪ Loss of grasslands, abandoned lands, riverbanks that can be of significant importance to especially mobile Indigenous Peoples ▪ Expansion of private forestry may lead to land grabbing resulting in the demolition of traditional spiritual and holy places, and temples in and around forest areas.
Environmental impacts	
▪ Promotion of appropriate agro-forestry/forestry in marginal, abandoned and drought prone lands ▪ Reduced deforestation / illegal logging ▪ Increased supply of forest products ▪ Increased tree planting ▪ Increased energy sources ▪ Enhanced scenic value / sense of place ▪ Improved soil fertility / productivity / water retention	▪ Risk of conversion of natural forest to monoculture
Strategy # 4: Improving land uses	
Social impacts	
▪ Employment generation through economic and market-based incentives packages to promote optimal land use	▪ Restriction of access to forest resources particularly the poor and marginalized forest dependent people
Environmental impacts	
▪ Improved soil fertility / productivity / water retention ▪ Reduced land degradation / restored degraded lands ▪ Reduced soil erosion, landslides, flooding ▪ Maintenance of watersheds / aquifers ▪ Enhanced scenic value / sense of place	▪ No particular adverse environmental impacts
Strategy # 5: Clarifying forest tenure and carbon rights and sharing fair benefits	
Social impacts	
▪ Improved rights and access to land and forests ▪ Improved in benefit-sharing mechanism ▪ Increased participation and ownership	▪ Risk of unequal distribution of benefits and escalation of social conflict ▪ No or less benefit due to unclear land and resource use right ▪ Perverse incentives payment mechanism of a REDD+

	initiatives may reward wealthier 'deforestation agents'
Environmental impacts	
▪ Reduced deforestation / illegal logging ▪ Increased supply of forest products	▪ Forest loss/degradation from improved access to forest
Strategy # 6: Promoting enterprise, livelihoods and employment opportunities to forest dependent poor and marginalized	
Social impacts	
▪ Enhanced livelihoods and/or creation of employment opportunities ▪ Promotion of community-based enterprise development with value addition to locally available biological resources, ▪ Alternative income opportunities for the forest-dependent poor and marginalized people ▪ Improved market access / surplus products for markets ▪ Increased supply of, access to forest products	▪ Stakeholder conflicts, including between participants and non-participants ▪ Poor and marginalized groups can be un-informed and thus may not get access to new employment opportunities. ▪ Women and marginalized losing free access to NTFPs due to elite capture of markets
Environmental impacts	
▪ Reduced deforestation / illegal logging ▪ Reduced grazing pressure ▪ Reduced fire incidence and fire damage	▪ Forest loss/degradation from improved access to forest ▪ Loss of ecosystem services
Strategy # 7: Increasing agricultural productivity for small and marginal farmers	
Social impacts	
▪ Improved food security and poverty reduction through enhance agricultural productivity and sustainability ▪ Increased supply and production of fodder and forage ▪ Reduced forest encroachment through more equitable access to productive land, and by increasing agricultural productivity	▪ Dependency on external inputs (fertilizer, seed, pesticides etc.) resulting in further exclusion and marginalization ▪ Poor and the marginalized groups with small land holding not getting much benefits ▪ Landless not getting any benefit
Environmental impacts	
▪ Improved soil fertility / productivity / water retention ▪ Reduced land degradation / restored degraded lands ▪ Enhanced scenic value / sense of place	▪ Forest loss and degradation from agricultural intensification ▪ Chemical pollution from agricultural intensification ▪ Soil erosion due to agricultural intensification
Strategy # 8: Increasing access to affordable and efficient alternative wood and energy	
Social impacts	
▪ Positive health impacts due to reduced workloads and drudgery for local people in general and women in particular and saving their time for other productive purposes. ▪ Improved access to reliable and sustainable sources of energy reducing dependency on forest	▪ Women, poor and the marginalized groups may not afford fuel wood-efficient, alternative or renewable energy technologies ▪ Poor and marginalized people may not be able to access
Environmental impacts	
▪ Decreased carbon emissions / increased carbon	▪ Forest loss/degradation from improved access to forest

sequestration/maintain carbon stocks ▪ Increased energy sources ▪ Reduced pressure in forests	▪ Environmental pollution due to increased solid waste
Strategy # 9: Developing synergy among various sectors, sectoral policies and legal framework	
Social impacts	
▪ Improved inter sectoral coordination and cooperation for forest development ▪ Increased access to forest products and level of ownership of the stakeholders	▪ No-decisions due to continuation of inter-sectoral conflict
Environmental impacts	
▪ Collective efforts leading to address deforestation and forest degradation ▪ Better management of forests and biodiversity	▪ Further deterioration if collective understanding is not developed
Strategy # 10: Strengthening institutional performance and service delivery	
Social impacts	
▪ Increased community participation in decision making ▪ Improved Transparency and Governance ▪ Promotion of gender equality and social inclusion with Free, Prior, Informed, Consent (FPIC) ▪ Empowerment of forest dependent communities and recognition of their traditional usufruct rights	▪ Inadequate and superficial consultation can further exaggerate social exclusion ▪ Politicization of community decisions resulting in elite capture
Environmental impacts	
▪ Indirect environmental benefits through improved performance and service delivery	▪ No particular adverse environmental impacts
Strategy # 11: Enhancing capacity, capability and improving collaboration and cooperation	
Social impacts	
▪ Increased stakeholder engagement and participation promoting transparency and governance ▪ Enhanced collaboration and cooperation among the stakeholders for uninterrupted use rights and equitable benefit sharing in communities ▪ Reduced forestry-related illegal activities thus reducing leakage. ▪ Increased employment and income generation opportunities within the country for local communities.	▪ Token participation of women, *Dalits*, IPs and other marginalized groups if not sensitive to existing gender discrimination and social exclusion.
Environmental impacts	
▪ Increased capacity to manage forests and biodiversity ▪ Improved skills and knowledge on environmental aspects	▪ No particular adverse environmental impacts
Strategy # 12: Promoting forest and climate-friendly infrastructure planning, construction and maintenance	
Social impacts	
▪ Increased participation / ownership,	▪ Loss of access to forest and sources of livelihood if IEE

employment opportunities and better access to market ▪ Local ownership and sustainability of development projects. ▪ Increased environmental & social awareness	and EIA recommendation not strictly implemented. ▪ Possibility of further marginalization of landless, women, poor and marginalized people
Environmental impacts	
▪ Reduced environmental risks/ hazards / disasters ▪ Enhanced scenic value / sense of place ▪ Reduced pressure on forests	▪ Decline of biodiversity in compensatory plantation ▪ Habitat fragmentation by infrastructure development ▪ Loss of ecosystem services
Strategy # 13: Establishing and maintaining forest information, monitoring, reporting and verification mechanism	
Social impacts	
▪ Increased easy access to information on forests, plan, plan programs including safeguard measures ▪ Increased public engagement in forestry plan, policy and programs ▪ Improved involvement of communities and stakeholders in SIS, and MRV	▪ Manipulation in reporting for higher incentive leading to false information ▪ Extra-burden to few members of communities increasing their work load
Environmental impacts	
▪ Increased capacity of local people to manage local environment by increasing levels of awareness and knowledge ▪ Improvement in land use and management of forests and biodiversity conservation through improved information	▪ Manipulated or false information can lead to further deforestation and forest degradation. ▪ Miss-interpretation of data and information can lead to wrong land and management practices

3. Setting up the Reference Level (RL)

Setting a Reference Emission Level or Reference Level (REL/RL) is an exercise of critical importance in terms of determining the performance level or baseline against which Nepal may be held accountable once the RL has been set, reviewed, approved, and fixed. Therefore, it is an exercise that should not be taken lightly or be rushed.

The steps that need to be followed include making assumptions how the historic trends and current situations will evolve in the (near) future. Following from there, the next step would be to look at the aspirations of Nepal – how does it wish to deviate from that trend to improve its performance, and what policies must be put in place to realize those aspirations.

In summary, the process of determining a REL/RL is composed of 3 elements:

A. Historic trends to date
B. Business as usual projections up to 2020 or 2050
C. Trends as projected towards 2020 (or 2050) in the case of successful implementation of REDD+ policies

A number of phenomena that cannot be influenced really but that do impact the emissions and removal levels should be taken into consideration as well when constructing a REL/RL. Even though they are outside the direct influence sphere of people, it is important to try and model the impact of the phenomena as they may cause significant changes in carbon stocks and or emission and removals and can therefore cause problems with meeting targeted levels of emission reduction, even when self-imposed. These phenomena are the following:

D. (Anticipated) disturbances in the context of force majeure such as natural occurring fires; and,
E. Phenomena that will occur, will have an impact on forest extend and forest growth, but that cannot be manipulated, such as for instance, climate change, changing weather patterns, elevated CO2 concentrations in the atmosphere that impact forest growth, etc.

As has been established in the previous chapters, at present the basis for constructing a complete, accurate, and precise national REL/RL for Nepal is too thin as the current situation cannot be quantified with sufficient accuracy. That also limits the possibilities to say something about the future. Below a short recap is provided related to data sets as presented in previous chapters, in particular in chapter 2.2; followed by a description of the method to be deployed to determine a RL for Nepal.

3.1 Forest assessment data sets to date

The Forest Resource Assessment (FRA) project (2010-2014) constitutes the most comprehensive forest assessment of **recent years** in Nepal. It conducts an assessment for the whole country and provides national-level baseline data. The project applies a combined method using remote sensing data and periodic ground inventories measurements throughout all major forest types of Nepal. The ground inventories are based on a network of around 1500 permanent sample plots in the forested area. FRA Nepal produces fresh data on forest cover and forest cover change. The FRA has published a report on Tarai (FRA/DFRS 2014) and Churia Forests (DFRS 2014) with species-wise growing stock, biomass and carbon stock (above ground and below

ground) by forest type, and development region. Similar reports for remaining physiographic regions are expected to be published soon.

In addition, FRA has applied LiDAR technology on Tarai Arc Landscape area (TAL). The so-called LAMP method (see chapter 3.2) has been used to generate forest biomass maps and activity data to create a RL for the period 1999-2011 for the 12 districts of TAL area.

The most comprehensive **historic** forest assessment available for Nepal is from the Land Resource Mapping Project 1976-1984 (LRMP 1986). It is a wall to wall assessment using a consistent methodology. Mapped classes comprise forest (divided into forest type zones and three different canopy density classes) and scrub. The data are at scales 1:25.000 and 1:50.000 and have been digitized. However, the data are not easily compatible with the new FRA data. But they can possibly be integrated with other existing data (see below) and field samples to create a provisional historic reference map of forest cover for Nepal. In addition, reclassification of historic remote sensing data will be necessary to allow the calculation of reference levels.

Other existing historic datasets for the whole of Nepal:

- 1994 National Forest Inventory. This dataset is incompatible with the LRMP data because it has a lower resolution (minimum forest cover >1ha) and does not distinguish between different forest density classes.
- 2000 Japan Forest Technical Association Information System Development Project. Indian Remote Sensing (IRS) data from 1999-2000.
- 2009 FAO Global Land Cover Network (GLCN) LCCS for Nepal. The dataset is not easily compatible with the LRMP data because it focuses on land use and land use change. It provides only very limited information on forest degradation.
- ICIMOD Land Cover Data, 1990 and 2010

3.2 Drivers of deforestation and forest degradation

Drivers of deforestation and forest degradation are complex and vary between Nepal's physiographic regions. Many underlying causes are a result of a combination of internal and external factors to the forestry sector, including socio-economic factors such as population increase and its distribution, poverty, land scarcity and the status of Nepal's level of economic growth and commercial development. Governance and cultural factors are both cross-cutting and are also related to a number of the direct drivers. It is expected that population growth and forest product and land demands will aggravate deforestation and degradation activities in the coming years.

Chapter 2.2 has provided insights on the drivers as analysed to date and applicable in the context of Nepal. Other studies have identified drivers as well. These are contained by Annex 5 for the sake of comprehensiveness but the drivers as presented in chapter 2.2 are those responsible for the current situation and trends.

3.3 Methodology and Approach for setting up the RL

Constructing a RL will follow the step-wise approach (Herold et al. 2012) as suggested by the UNFCCC Decision 12/CP.17 "Guidance on systems for providing information on how safeguards are addressed and respected and modalities relating to forest reference emission levels and forest reference levels as referred to in

decision 1/CP.16". This allows the use of available data (even if uncertain) to provide a starting point for RL establishment with simple projections, based on historical data (Step 1), progressively updating the RL based on more robust national datasets for country-appropriate extrapolations and adjustments (Step 2) and ultimately basing the RL on more spatially explicit activity data and driver-specific information support (Step 3).

A consulting firm has recently elaborated and submitted a report on Forest Reference Level for REDD+ in Nepal to the RIC. The overall concept of using land covers change analysis to derive activity data for the forests of Nepal follows the international best practices. In the absence of frequent ground surveys, this analysis must have been necessarily based on satellite data to a large extent. The report has made a valuable contribution in its analysis of census/demographic data to relate emissions to specific drivers. While it may be challenging to reconcile this analysis with satellite-based land cover change analysis, the census data helps provide at least a qualitative understanding of the magnitude of two of the major drivers.

However, some caution must be taken in relation to the presented results. There have been a limited number of ground verification plots available to verify the historical map data. Thus, it brings up uncertainty on reliability and accuracy of the original land cover data, especially regarding to the reference years 1990 and 2000. For example, historically high gross emissions from deforestation in the High-Mountain region can be considered as an unexpected finding. So, the map products and analysis results should be further verified with field survey and high resolution data. The 10-year intervals used in the analysis raise some concerns about classification confusion resulting from a lack of temporal resolution. Since much of the analysis is based on fractional indexes of ground cover, regrowth and regeneration can be confused with forest cover.

Nepal could improve the results of the National RL analysis (step 2) in order to achieve acceptable levels of accuracy to allow Nepal to get performance-based payment from the World Bank and other donors. It is recommended to proceed with step-wise approach (Herold et al. 2012) towards the National Reference Levels, starting with the large-scale jurisdictional projects at sub-national level. The SMF-Based Emission Reduction Program in Nepal's Tarai Arc Landscape is an important step towards that direction. It is possible to improve national reference levels with the Lidar-Assisted Multi-source Program (LAMP) approach, as it has been implemented for establishing Reference Levels (RLs) in the Tarai Arc Landscape (TAL) comprising 12 districts. This approach was welcomed and endorsed by the Forest Carbon Partnership Facility (FCPF) of the World Bank.

If the entire country is covered by a reliable and easily updatable methodology for setting up RLs and subsequent Monitoring, Reporting and Verification (MRV) then domestic leakage will have been addressed at the same time. In case of LAMP only a small sample (less than 2 % coverage) of airborne lidar data needs to be acquired once. Then, the reference level can be updated as new satellite data and field surveys (for verification) become available.

The process utilized in developing the TAL RL, LiDAR-Assisted Multi-Source Program (LAMP), is described in detail in a peer-reviewed technical paper (Joshi et al. 1014). It incorporates the following data sets: airborne-collected LiDAR data covering 5% of the extent of the project area; best available Landsat or other satellite data; the 1998 GoN Topographic Base Maps; the 1984 GoN Land Resource Mapping Project (LRMP); field data collected for biomass model establishment (12.6m radius); field data for verification (30m radius) and MDA Information Systems LLC's Persistent Change Monitoring global dataset.

Activity Data (AD, for the five activities defined by IPCC) was compiled from Landsat image analysis for a period of over ten years. The approach involves the classification of the TAL forest into four different forest types (sal, sal mixed, other mixed, riverine) for the time periods 1999-2002, 2002-2006, 2006-2009, and 2009-

2011 from Landsat imagery. Change between forest structure classes is calculated for the time periods to generate Activity Data in hectares for the five activities defined by IPCC. The forest types were defined in the LRMP and updated and verified (Joshi, et. al., 2003).

Activity data are obtained by using a model built on spectral mixtures such as PV (Photosynthetic vegetation), NPV (Non-Photosynthetic Vegetation), Soil and NDFI (Non-Dimensional Fractional Index). This approach allows carbon credits to be assigned essentially on a stratum-wise basis, resulting in Tier 2 level spatial resolution. Every stratum of forest is divided into two classes: intact and degraded. Areal units can gain or lose credit on the basis of changing their class between these two classes and non-forest.

In Tier 2 level, the Emission Factors (EF) are computed from a Lidar sample of the forests. The Lidar sample typically covers between one and five per cent of the total forest area, and it should feature all significant forest types. This sample typically covers between one and five per cent of the total forest area, and it should feature all significant forest types. The Lidar-based estimates are very accurate, providing a coefficient of determination R^2 of 0.9 (Joshi, et. al., 2014), they can be used to produce "surrogate field plots". These thousands of surrogate plots are then used in providing very accurate estimates of EF's for each forest stratum and their 'intact' and 'degraded' sub-strata (ER-PIN 2014).

The process integrates the best available forest area map. For the TAL RL, the 1998 GoN Topographic Base Maps has been applied. For future time steps, the updated FRA data can be applied.

The baseline data created with this approach can be combined with the spatial regression model embedded in Computable General Equilibrium (CGE) model as proposed by the R-PP, and thus support the projection of carbon stock changes into the future under diverse scenarios.

The recommended carbon pools to be measured should include total aboveground biomass (including trees, shrubs), and belowground biomass. These two pools constitute the great majority of GHG emission and can be measured in a sound statistical manner, with a level of uncertainty statistically determined. For aboveground biomass, the fraction of standing deadwood can be estimated using remote sensing techniques. Estimates of lying deadwood are difficult to include because they are connected with a high uncertainty due to strong spatial and temporal dynamics.

The contribution of Soil Organic Carbon (SOC) to total carbon dynamics is marginal. Studies have indicated that the correlation between soil carbon and land use dynamics is erratic and a sufficient precision is difficult to achieve (ER-PIN 2014). Furthermore, the cost for including soil carbon measurements is high compared to the benefits.

The GHG to be included in the RL will be CO2, given the absence of mangroves and peat swamps in Nepal.

3.4 Functioning of the Preliminary RL at National and Sub-National Level

The described RL uses a clearly documented methodology that has been published by Joshi et al. (2014) in Banko Janakari Journal (A Journal for Forest Information of Nepal). Publication in an international journal is planned. Various experts from following institutions have contributed to this work: WWF Nepal, WWF U.S., Conservation Biology Program of the University of Minnesota, Arbonaut Ltd. (Finland), Biodiversity and Wildlife solutions Programme (U.S.), Forest Resource Assessment (FRA) Nepal Project, Department of Forest

Research and Survey (Nepal), Department of Soil Conservation and Watershed Management (Nepal), Lappeenranta University of Technology (Finland), University of California (San Diego).

The methodology as proposed here is the outcome of intense collaboration between the involved Nepalese and international experts. The methodology was also discussed with stakeholders from the REDD-Cell and has been endorsed by the Forest Carbon Partnership Facility (FCPF) of the World Bank.

While the national RL and MRV frameworks for Nepal are still under development, the developers of the TAL RL have consulted with parallel efforts underway to develop the national frameworks in order to facilitate the eventual integration and conciliation of the sub-national effort with the national frameworks. The parameters for the development of the RL are consistent with the FCPF Carbon Fund Methodological Framework, and the RL accounts for all of the activities included in the Emission Reductions program, including deforestation, forest degradation, and regeneration.

The proposed approach can be applied to generate RLs either at Tier2 or Tier3 spatial level. It has therefore the potential to be upgraded to higher spatial resolution. Most parts of the method are based on an automated process that can be integrated into an operational system. Necessary tools have been developed and are available for RL calculation at national or sub-national level.

3.5 Proposal for further adjustment of RL

Once a LAMP campaign has been completed, further adjustment of RLs can be conducted by repeating the same analysis over a more recent set of years, especially if there appears to be an increase in the rate of deforestation and forest degradation, as may be the case in Nepal since 2006.

If a later sequence of years – say, from 2006 till 2015 – could be used instead of 1999 till 2011, there could be a possibility of having even more threatening RL trend, reflecting the period after the end of the civil war. In any case, new Lidar or field campaigns are not necessary for the sake of RL adjustment. When the initial data set of field plots, Lidar sampling and Landsat imagery are contemporaneous, the same models will apply in the future. For this reason, future MRV and RL adjustment are desktop exercises with recent satellite imagery, to which the same regression models will be applied.

Even if the straightforward approaches of continuing to use the Tier2 methodology in the coming years may well prove quite adequate, there are at least two potential improvements that may further enhance the accuracy and relevance of RL's for Tier3 approach:

The first one is the use of other satellite images in addition or instead of Landsat. Other satellites have complementary properties to Landsat. They may have a higher spatial resolution, allowing for a more fine-grained analysis of RL's. They also come in other imaging modalities, such as Synthetic Aperture Radar, or SAR, satellites that provide a signal that correlates with tree height – a feature that optical imagery like Landsat does not have.

In some recent studies it has become apparent that with a correct statistical regression method, such as the Sparse Bayesian regression employed in the TAL campaign, the biomass and carbon density estimates produced are to a large degree independent of the satellite imagery used. In the case of TAL, similar estimates were obtained with both Landsat and RapidEye imagery. This means that as long as there is some temporal overlap between the Lidar sample and new satellite imagery, many different images may be used in order to

reliably calculate the same Above-Ground Biomass (AGB) estimates. This property provides for a more secure and more frequent updates of RLs and consequently also more frequent and more accurate payments of REDD+ credits.

The second improvement to reach Tier3 level could be to abandon stratification altogether. Instead, estimates are provided directly of AGB per hectare and the Emission Factors for each unit of estimation – typically one hectare – are calculated directly as differences in the AGB estimates. This allows any parcel of forest land to gain credit that is proportional to its true carbon increment. This gain is not any more dependent on whether the parcel is classified as degraded or not. The corresponding assignment of REDD+ credit will then be more predictable and continuous and also more just. This will lift the estimates to Tier 3 – or the highest – level.

The reference level will be adjusted when species-specific emission factors and allometric equations will be available for Nepal.

3.6 Work Plan for Proposed Adjustment in the RL

RL/REL Business-as-Usual (BAU) baseline can be proposed to be adjusted when the national circumstances have been changing over the historical period and the effects can be proved to appear in the future. Especially the upward adjustment on the country's future forest emissions and removals should be backed up with reliable and conservative evidence. For example, national policies, such as road-building, investment, and development programs, can have major impacts on future forest use, deforestation rates and further on forest emissions. In order to consider the national policies and programs in adjustment, their implementation must have started before the end of 2010 by UNFCCC COP-16 decision (1/CP.16).

The other type of adjustment reflects considerations such as equity (e.g. on the basis of biophysical or economic disparities) may subsequently be made to link RELs/RLs to REDD+ results-based finance. Regression analysis can be used as a tool to provide some statistical evidence to justify the necessary adjustments. To build a regression model, there need to avail independent variable data for at least 3 points of time at national level. Such variable data may include (but are not limited to) to historical deforestation, current forest cover, Gross Domestic Product (GDP), agricultural GDP, human population size and road network coverage indicators. Optimally a more robust national model can be developed if disaggregated regional data can be used.

4. Measurement, Reporting and Verification (MRV) System

4.1 Nepal's National Forest Monitoring System (NFMS)

4.1.1 Design and Operational Mechanism of Nepal's MRV System

General

MRV systems allow the measurement, reporting and verification of changes in carbon stocks and in emissions and removals of greenhouse gases. The system will integrate national, sub-national/district and management unit level to account for contributions to carbon emissions and removals at all levels. The information produced by the MRV system will be integrated into the NaFIMS to be shared with relevant stakeholders

The design of the monitoring system can build on the activities conducted under the FRA project and the work already carried out for Tarai Arc Landscape (TAL). The design of a monitoring system is closely linked with the technical approach for calculating emissions and removals since the system will be designed to monitor carbon stock changes over time. It can be based on a combined method using remote sensing data and periodic ground measurements throughout all major forest types in Nepal. Local communities can be integrated as much as possible in the monitoring activities. The system will support decision making related to REDD strategy options. It will provide information to governmental organisations, NGOs, research institutions, the public and other relevant institutions.

Activity data and Emission factors

Activity data can rely on the reference forest map used as benchmark and the periodical assessment of land cover changes and changes in carbon stock in forest areas that remain forests. The approach in Nepal will provide spatially explicit land-cover change assessment and conversion between classes. The main parameters to be measured for activity data will be deforestation, forest degradation and forest enhancement/regeneration.

The land cover baseline will contain the land cover categories defined in the existing frameworks for the Land Use, Land Use Change and Forestry (LULUCF) sector under the UNFCCC: forest land, cropland, grassland, wetlands, settlements, and other land. Forest land will be further subdivided by forest type and forest density: closed, medium stocked and open. The threshold generally adopted for density classes are 10%, 40% and 70%.

By using multi-temporal analysis of remote sensing data in combination with field verification, activity data on forest area changes and forest degradation will be estimated. Changes in carbon content within forested areas can be monitored very accurately using a combination of satellite imagery and airborne laser scanning. The LAMP process (Joshi et al. 2014) described in Chapter 4.2 provides a robust methodology for such long-term forest monitoring that provides activity data and emission factors for above- and below-ground biomass. It is based on a sample of lidar and field plot data as well as freely available satellite imagery (e.g. Landsat). Field plot data are processed using appropriate allometric equations to derive above-ground biomass.

Once the RL is set up (see Chapter 4.2), the lidar and field campaign does not need to be repeated within the next 10 years, to our current knowledge. Activity data and Emission factors can then be derived by applying the developed lidar-based biomass models to future satellite imagery, i.e. the method is not data intensive for future monitoring. Field verification will be applied to validate the derived biomass levels for future points in time. When applied at national-level the method has the capacity to assess leakage effects within the country.

Once a sufficiently accurate digital terrain model is available for Nepal, the LAMP method has the potential to use data from radar satellite imagery instead of lidar to produce spatially explicit maps of carbon stock changes.

Ancillary information on forest degradation such as decrease in species diversity, soil depletion etc. will be monitored through permanent sample plots established through the FRA project. Measurements will be repeated in periods varying between 5-7 years depending on the availability of resources.

Spatial resolution

It is envisaged that Nepal will use spatially explicit activity data and forest strata level emission factors within the present context. Quantification of Emission Factors can qualitatively be further improved after capacity building has taken place. The TAL LAMP method in its current form can be applied to provide both Tier 2 and Tier 3 data and provides data on changes in carbon stock at 1 hectare resolution.

4.1.2 Rationale for the Selection of Methods Proposed for MRV System

The benefits of the proposed approach are the following, among others:

- Once the initial Lidar and field campaign have been completed, there is no further need for future Lidar or field campaigns, apart from field campaigns conducted for validation purposes and for collecting other types of forest information
- MRV can be conducted frequently – typically on an annual basis – whenever new satellite imagery becomes available
- It is not dependent on any specific satellite data. Many different types of satellite imagery can be used.
- With LAMP, the RLs have very narrow confidence intervals because the estimation methods used in them are unbiased. This property maximizes the REDD+ credit obtained, since it is always calculated on the basis of the lower 95 per cent confidence level.
- The MRV can be fully conducted by the Nepalese experts with proper training and capacity building programme.

4.1.3 Action Plan to Institutionalize a Fully Operational MRV system

In order to ensure effective, efficient and transparent governance of measurement, monitoring and management of data under MRV system, DFRS, the national MRV Implementing agency, under the overall guidance of the Apex Body will be responsible for:

a) Periodic execution of forest assessments for deforestation and degradation monitoring;

b) Designing, maintaining and operating the National Forest Information Management System (NAFIMS);

c) Coordinating the collection of sub-national level information;

d) Disseminating NAFIMS deliverables through web portal;

e) Providing technical guidance and institutional/capacity support to the parallel institutional setups at sub-national/district/local community levels

The sub-national, district and/or local government level MRV institutional setups will act as the implementing entities to implement the decisions taken by respective sub-national/District Forest Coordination Committees

(DFCCs). These sub-national/district and/or local level entities will have a REDD Cell (as a new section) within the Regional Directorate and DFO structure.

Under the Survey Division (which is most likely to have NAFMIS and MRV operationalization, maintenance and management responsibilities) of DFRS, a MRV section will be responsible for organizing all MRV related functions needed for conducting MRV with the LAMP methodology from national to sub-national and to district/local levels and managing the MRV professionals. This section will be coordinated by a MRV coordinator who will have dual reporting responsibility – reporting to the divisional head in DFRS and also to the REDD division in the MFSC. MRV section will manage and maintain the MRV system and also promote data dissemination about the project(s).

The MRV implementation should be carried out by the Central MRV Section. The MRV section will require one Coordination unit and four independent but closely connected units (see also section 2.6):

1. Database/IT/Metadata Unit
    - Database administration (management and maintenance of MRV database structure, etc.)
    - System administration (management and maintenance of IT web platform interface, server system etc.)

2. Remote Sensing/GIS Unit
    - Remote sensing data processing and analysis,
    - Production of Land Use/Land Cover maps,
    - Change detection in different forestry and land use classes using multi-temporal remote sensing data and ancillary data,
    - Spatial data integration in the MRV database system,
    - Preparation of reporting data for Reporting Unit on request.

3. Forestry Inventory Unit
    - Coordination of National forest inventory and inventories at sub-national district/local governance unit level,
    - Estimation of GHG emissions using specific algorithms and models based on field data,
    - Results integration into the MRV database system,
    - Preparation of reporting data for Reporting Unit on request.

4. Reporting Unit.
    - Periodic standard MRV reporting (consistent with UNFCCC reporting guidelines),
    - Compilation and dissemination of aggregated data and information.

Continuous Forest Inventory

The FRA Nepal project has developed a modern technique of forest inventory, using appropriate scientific methods and a statistically sound approach. So it is natural to implement a Continuous Forest Inventory based on the same approach and methods used by FRA Nepal. In particular the same sample plot design should be implemented. Homogeneity in the field measurements is essential for assuring comparability of the results, which is an essential pre-requisite for MRV.

For the Continuous Forest Inventory design in the context of MRV it is proposed to revisit 1000 FRA Nepal field plots over a cycle of 5 years i.e. to measure 200 plots in the field every year. The decision which of the

FRA plots will be re-measured in the MRV design will depend on the final results of FRA. This kind of field validation data will also help as independent validation and control of LAMP based estimates of biomass. For this purpose, current permanent plots should preferably be expanded to 30 m radius plots, or even 1 hectare plots. In the latter case, biomass assessment would not be done by measuring tally trees, but rather by inventory by compartments. The 30 m plot at the center would still be measured by the current field inventory method.

One criterion for selecting Permanent Sample Plots could be deforestation rates, i.e. sampling with greater intensity in areas that are more subject to deforestation and anthropic pressure for fuel wood demand.

4.1.4 Stakeholder Participation over the course of MRV system development

The National Forest Monitoring System (NFMS) in general and MRV system development initiation in particular have recognized role and responsibilities of stakeholder of different types and at different layers. The stakeholders include from different sectors of the government, bi-and multilateral development agencies, non-government and civil society organizations at different levels. Coordination between and among these stakeholders and their involvement is essential for development and effective implementation of NFMS including MRV. It is particularly, emphasized to ensure local stakeholders and forest managers in all forest management regimes (e.g. CF, CoFM, government managed forests and PAs) participate and engage in field based monitoring as required. An MRV system technical support/advisory committee is proposed in the National REDD+ architecture (in line with the proposed RPP), with an objective to fulfill its research, technology and capacity needs including institutional strengthening in future. An associate objective is to maintain transparency in functioning of M and MRV at national level and ensures that the perspectives of relevant MRV stakeholders and forest managers are captured in course of management, maintenance and strengthening of MRV system on a regular and continued basis.

The MRV Working Paper 3 (2014) has identified the key stakeholders of Nepal's M and MRV system, and analyzes what are their stakes in it through a matrix.

Table 20. Stakeholders' Stake, Influence and Interest in M and MRV System

Category of Stakeholders	Stakeholders	Stake	Influence	Interests
Government	MFSC: DFRS, DoF Other MFSC departments Relevant Line Ministries- Land Reform, Agriculture and Cooperative, Water Resources, Physical Infrastructure and Transportation, Local Development, Energy, Science, Technology and Environment, Finance and National Planning Commission (NPC), local government bodies-	Forest/Carbon enhancement, Updating/management of forest information system Carbon emission/removal accounts of their respective sectors	Influences projects/carbon buyers, payment mechanism and reports to UNFCCC Policy measures having implications on carbon emissions and removals	Retain control over MRV system, share carbon benefits In contributing towards green economic development

Category of Stakeholders	Stakeholders	Stake	Influence	Interests
	DDCs and VDCs			
Beneficiary group	Community based forest managers e.g. CFUGs, CFM groups, LhFGs etc.	Ensure carbon measurement is carried out through participatory, transparent and locally governed process and procedure	Local forest protection and enhancement	Get maximum possible benefits from Forest carbon payment
NGO/CSO	FECOFUN, NEFUG, ACOFUN, NEFIN, NAFAN, HIMAWANTI and others	Ensure good governance in the system in favor of IPs local forest managers and marginalized forest dependent groups	Capable of advocating and mobilizing the people and CBOs on M and MRV system related issues	Retain peoples' CBO's trust and confidence with respect to REDD+ related issues of public Interest.
International development Agency	ICIMOD, WWF, DFID, SDC, USAID funded forestry projects	Ensure SFM, livelihoods security and poverty alleviation; Promote science and technology, and democratic governance mechanisms	Influences policy processes and outcomes, including development financing	Maintain the public policy influencing capacity
Academia/Research	Tribhuvan University, Institute forestry. Kathmandu University, NAST, National Information Center of GoN	Technology transfer, Maintenance and updating of technology and synchronization of systems	Influences the technology transfer and system harmonization	Remain at the center of science and technological development

Source: GoN (2014), MRV Working Paper 3

The matric presented above helps us to understand how the stakeholders could potentially influence and/or get influenced by the inputs and outputs of the M and MRV system and what kind of interest they have in the M and MRV outcomes.

4.2 Forest Information Management System for multiple benefits, other impacts, governance and safeguards

4.2.1 The National Forest Information Management System (NAFIMS)

The FRA Nepal project has developed an Open Source Forest Information System (OSFIS). This system in its current stage manages the inventory data, spatial data sets and also has a standard platform for data dissemination. The OSFIS, however may not be considered as a full Management Information System as the

system is primarily designed for the ongoing inventory only. It needs to be upgraded to enable continuous monitoring of the permanent sample plots with advance UIs and modules and database structure.

The NAFIMS system should be based on a reliable and efficient platform that does not require extensive expertise in Information Technology to maintain. The system should be accessible for the general public through internet. This requirement requires a solution based on Software as a Service (SaaS) that resides on a cloud and is accessible through a web application.

Ever since Google Maps has become ubiquitous, the benefits of accessible and easy-to-use map services have become increasingly obvious to users of Geographic Information. A browser is all that is needed to study thematic maps, even forest maps, in detail. The user interfaces of such WebGIS systems are easy to learn and use. And most importantly, all information is backed up frequently, so that hardware crashes and other calamities will not destroy valuable information and not even decrease their usability by much.

Other benefits of WebGIS systems include modular upgrades to different functionalities in the system. Web-based information systems consist of individual and independent functions that share common access interfaces. These interfaces are very often based on and supported by standards developed by the Open GIS Consortium (OGC) so that they have the widest possible extendibility with other sources of maps and other thematic layers, as well as with different GIS systems that can be used for deeper analysis or for the production of specialized forest information layers.

The NAFIMS will be designed as an overarching information management system that includes tools and protocols for system managers and interfaces for accessing data, information and maps from the NFD and other relevant databases, links to and between these databases, analysis, synthesis, tabulation and other thematic tools. The NAFIMS will include tools for decision support modules and user friendly graphical user interfaces for data query and reporting, GIS analysis and mapping. The GIS module will include standard web mapping interfaces and tools.

The information system will be developed using open source application platforms with industry standard administration and management interfaces and it will deployed in the web as a “software-as-a service (SAS)” system. Standard operating protocol will be developed for accessing data and information through NAFIMS. Key modules to be included are forest resources, forest carbon, working plan and programs, users and beneficiaries, remote sensing, Land use, Land-use Change, and Forestry (LULUCF), REDD activities and social and environmental safeguards (SES) indicators.

The NAFIMS will be deployed through hosting in a dedicated web application server to be based in GIDC which has facilities for space, continuous power supply, high speed internet connectivity, security and technical support. A backup server will be set up at the National Information and Technology Centre (NITC), Singh Durbar, Kathmandu.

A study is underway that will develop guidelines for institutional coordination and standard operating procedures of NAFIMS. Recommendations will be prepared for the institutional management of the system including manpower, computer hardware and software to ensure system sustainability and use. Relevant government staff will be trained to operate, maintain and administer the NAFIMS. After operationalization continued support for system operation should be secured through procurement of maintenance services.

WebGIS system for forest use

A prominent candidate among WebGIS systems for forest use is the OpenForis Collect Mobile (OFCM) system by FAO. OpenForis is itself just a framework and core of a Forest Information Management System, but it already has a number of useful extensions, such as OpenForis Collect for collecting field information on a mobile phone equipped with GPS. SaaS systems are much more affordable to build and maintain than a tailored information system. This is a major benefit also because information technology moves quite fast and almost any tailored system is likely to become outdated in no more than a decade.

In OFCM, the field data can be collected in electronic forms instead of paper forms. The electronic forms guide surveyors to use the common methodology and also forms can contain basic validation for input data, ensuring the higher quality of the survey data. Also as the data is sent to the central system in electronic format, the typing errors of the traditional paper form data collection process will be eliminated. In OFCM, the user interface can be defined with XML type files allowing us to define the field forms without writing addition code. The surveyors will be equipped with PDA or Tablet computer running Android operating system and the survey data will be transferred over Internet connection from PDA/Tablet to central server. In case the field team is working long periods of time in the area without internet connection, the field team can transfer the date to a laptop and save it to removable device e.g. CD and send the CD to the central location for upload by other means of transportation. More information about this initiative can be found at http://www.fao.org/forestry/fma/openforis/en/

The web-based information system supports easy importing and using files in different formats. These formats include ESRI Shape, KML, XML and CSV formats for transferring the data between web-based portal and 3rd party applications (ArcGIS, QGIS, MS Access etc.). Open Geospatial Consortium standard formats like Web Feature Service (WFS) and Web Map Service (WMS) can also be used for transferring the data between AWF and 3rd. party application.

4.3 Stakeholder Participation over the course of MRV system development

The GoN has recently developed an MRV system for REDD+ strategy implementation. The MRV system has recognized role and responsibilities of stakeholder at different layers. It has also recognized that coordination between and among these stakeholders and their involvement is essential for development and effective implementation of MRV. It is particularly, emphasized to ensure local stakeholders and forest managers in all forest management regimes (e.g. CF, CoFM, government managed forests and PAs) participate and engage in field based monitoring as required. An MRV system technical support/advisory committee is proposed in the National REDD+ architecture (in line with the proposed RPP), with an objective to fulfill its research, technology and capacity needs including institutional strengthening in future. An associate objective is to maintain transparency in functioning of M and MRV at national level and ensures that the perspectives of relevant MRV stakeholders and forest managers are captured in course of management, maintenance and strengthening of MRV system on a regular and continued basis.

The MRV Working Paper 3 (2014) has identified five categories of key stakeholders of Nepal's M and MRV system. The stakeholders include from different sectors of the government, bi-and multilateral development agencies, beneficiary groups of different management regimes including customary forest management practices, non-government and civil society organizations at different levels and academic and research organizations. The paper also analyzes what are their stakes in it through a matrix (see Table 21, below). The matrix has provided how the stakeholders could potentially influence and/or get influenced by the inputs and outputs of the M and MRV system and what kind of interest they have in the M and MRV outcomes.

Table 21. Stakeholders' Stake, Influence and Interest in M and MRV System

Category of Stakeholders	Stakeholders	Stake	Influence	Interests
Government agencies	MFSC: DFRS, DoF Other MFSC departments Relevant Line Ministries- Land Reform, Agriculture and Cooperative, Water Resources, Physical Infrastructure and Transportation, Local Development, Energy, Science, Technology and Environment, Finance and National Planning Commission (NPC), local government bodies- DDCs and VDCs	Forest/Carbon enhancement, Updating/management of forest information system Carbon emission/removal accounts of their respective sectors	Influences projects/carbon buyers, payment mechanism and reports to UNFCCC Policy measures having implications on carbon emissions and removals	Retain control over MRV system, share carbon benefits In contributing towards green economic development
Beneficiary groups	Community based forest managers e.g. CFUGs, CFM groups, LhFGs, IPs and Dalits etc.	Ensure carbon measurement is carried out through participatory, transparent and locally governed process and procedure	Local forest protection and enhancement	Get maximum possible benefits from Forest carbon payment
NGOs/CSOs	FECOFUN, NEFUG, ACOFUN, NEFIN, NAFAN, HIMAWANTI and others	Ensure good governance in the system in favor of IPs local forest managers and marginalized forest dependent groups	Capable of advocating and mobilizing the people and CBOs on M and MRV system related issues	Retain peoples' CBO's trust and confidence with respect to REDD+ related issues of public Interest.
International development	ICIMOD, WWF, DFID, SDC,	Ensure SFM, livelihoods security	Influences policy processes and	Maintain the public policy

agencies	USAID funded forestry projects	and poverty alleviation; Promote science and technology, and democratic governance mechanisms	outcomes, including development financing	influencing capacity
Academia/Research Institutions	Tribhuvan University, Institute forestry. Kathmandu University, NAST, National Information Center of GoN	Technology transfer, Maintenance and updating of technology and synchronization of systems	Influences the technology transfer and system harmonization	Remain at the center of science and technological development

Source: GoN (2014), MRV Working Paper 3

The National Forest Monitoring System (NFMS) is being developed by GoN and its recommendations and main features will be implemented as forest monitoring mechanism while implementing this REDD+ strategy.

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Annex 1 Review of Relevant National Policies relevant to REDD+

Land Use Policy 2012: The Government of Nepal has introduced new Land Use Policy in 2012. The major salient feature of it is that it classifies land into different categories and proposes policies accordingly. The policy anticipates that the land use for all purposes including development purposes will be used as per the land use plan. The land classified in the policy is agricultural, residential, commercial, industrial, forests, public, industrial, and others. It has also provisioned land pooling system for acquiring land for development projects. It also proposes Land Use Management Department for the effective implementation of the land policy. The policy aims to check rapid unplanned use or encroachments of forest land amidst rapid migration induced urbanization and enhance forest cover, very pertinent in the context of REDD+ strategy.

Climate Change Policy 2011: The main goal of the climate change policy is to improve livelihoods of the people by mitigating and adapting to the adverse impacts of climate change. The policy promises to adopt a low-carbon emissions socio-economic development path in consistent with REDD+ strategy and reiterates the country's commitment to national and international agreements related to climate change. One of the unique features of the policy is that it quantifies the time bound policy targets in many relevant areas and commits to allocate 80 percent of total climate fund to the local community. Most important policy coverage include climate adaptation and disaster risk reduction, low carbon development and climate resilience, technology development, transfer and utilization and climate friendly resource management.

Rangeland Policy 2012: Rangelands of Nepal comprise of grasslands, pastures, shrub-lands and other grazing areas. These play an important role in the country's farming systems and are the major feed resource for livestock and the wild life. Nepal's high altitude rangelands contain biodiversity with exceptionally high number of endangered species. For conservation and regulation of rangeland, Ministry of Agriculture Development brought out Rangeland Policy, 2012. The policy focuses, among others, on the enhancement of rangeland productivity, conservation of biodiversity and improvement of livelihood of people dependent on it.

National Parks and Wildlife Conservation Acts and Regulations: National park and wildlife conservation is governed by the act of 1973. It was amended 3rd time in 1989 and 4th time in 1993. The "National Park" as defined in the act is an area set aside for the conservation, management and utilization of flora, fauna and scenery along with the natural environment. It also provisions a "Strict Nature Reserve" to qualify the area of ecological importance or important for scientific studies. The "Wildlife Reserve" is defined as an area set aside for the conservation and management of wildlife resources and their habitats. After the act, many regulations in the related areas have been enacted. Such regulations include National Park and Wildlife Conservation Regulation 1974, Chitwan Nationa Park Regulation 1974, Wildlife Reserve regulation 1976, Himali National Park Regulation 1980, Khaptad National Park Regulation 1983, Buffer Zone Management Regulation 1996, Bardia National Park Regulation 1997, Conservation Area Management Regulation 1997 and Conservation Area Public Management Regulation 2000.

National Biodiversity Strategy and Action Plan: The national biodiversity strategy developed in 2002 follows a more cohesive and strategic approach to conservation at the landscape level. It focuses on the protection and wise use of the biologically diverse resources of the country, the protection of ecological processes and

systems, and the equitable sharing of benefits on a sustainable basis. It proposes both cross sectoral and sector specific strategies with focus on protected areas, forest rehabilitation and sustainable harvesting, agro-biodiversity, preservation and sustainable use of non-timber products and mountain biodiversity. It also envisages the mechanism for action. The action plans along with identifying the drivers of biodiversity loss, set national targets, design capacity development and developing indicators and monitoring approach. The strategy which is under revision is said to be emphasizing on promoting and harmonizing Aichi targets for biodiversity conservation with REDD+ safeguards.

National Wetlands Policy: The national wetland policy 2003 aims to conserve and manage wetlands with local people's participation for their benefit at the same time maintaining environmental integrity according to the terms and spirit of the Ramsar Treaty. Wetlands are considered to be fertile lands for agriculture and rich from the point of view of biological diversity and hence provide habitat for several species of wildlife and lie within various ecosystems of High Mountain and lowland plains. The policy has important bearing on the REDD+ strategy.

National Water Policy/Strategy: A Water Resources was enacted in 1992 covering surface water, underground water or water in whatsoever form for arranging rational utilization, conservation, management and development of the water resources. It focuses on timely legal arrangements for determining beneficial uses of water resources, preventing environmental and other hazardous effects and also commits to keep water resources free from pollution. In 2002, water resources strategy was developed and implemented. More distinct strategies for disaster management and environment, water supply, irrigation, hydropower and other economic activities like industry, tourism, fisheries and navigation are proposed there.

National Irrigation Policy: A new national irrigation policy was introduced in 2013 with the purpose of raising agriculture productivity, ensuring reliable year round irrigation facility and utilizing surface and underground water in a coordinated way. The policy commits to address the climatic changes, climatic risk and disaster risk management problems to be confronted in the course of irrigation development or expansion programs. It also commits to follow both adaptation and mitigation policies in such programs.

National Hydro-power Policy: The hydro power policy brought out in 2001 aims to generate electricity at a low cost, extend reliable and qualitative electric service throughout the country at a reasonable price, tie-up electrification with the economic activities including rendering of support to the development of rural economy and developing hydropower as an exportable commodity. In addition to emphasizing on large storage type hydropower and multi-purpose projects, it commits to develop hydropower as an alternative to biomass and thermal energy for environmental protection. It also commits to pursue mitigation measures for controlling or minimizing the adverse environmental impacts of hydropower projects. Provisions are also there to resettle the displaced families in the course of implementing hydro projects. It emphasizes on consumer demand management for the conservation of energy. The approach paper of the current plan (2013-2016) proposes to develop a 'Sustainable Energy for All' action plan for easy access to energy including alternative energies and equally stresses on efficiency in energy uses.

Environment Act and Regulations (EIA guidelines for sectors): The Environment Act 1997 provides legal basis for the conservation of environment, prevention and control of pollution and also provides the legal authority to develop regulatory measures for the conservation of biodiversity, and sustainable and equitable benefit-sharing by using genetic resources. It makes environmental impact assessment mandatory for the approval of the projects both in government and private sector. Special clauses related to prevention and control of pollution, protection of national heritage and environment protection area are included in the act.

Some of the sectoral laws have made explicit provisions of environmental assessment. The Forest Act, 1993 calls for carrying out EIA of the development proposals if they are to be implemented in the forest areas and/or passes through the forest area. The National Parks and Wildlife Conservation Act, 1973 contains a number of environment-friendly provisions and prohibit activities that will have adverse impacts on the environment. The Water Resources Act 1993 contains provisions to minimize environmental impacts, including soil erosion, floods and landslides. This provision calls for carrying out EIA study prior to project implementation. The Water Resources Rules, 1993 oblige the promoter to analyze environmental impacts of a proposal and state that such study should contain environmental control and safety measures and other necessary arrangements to resettle people during hydro-electricity development. The Electricity Act, 1993 also contains provisions to minimize soil erosion, floods, air pollution and damage to the environment while producing and transmitting electricity. The Tourism Act, 1978 also contains provisions to minimize waste and environmental pollution in the trekking areas. Scattered regulatory measures are also provisioned in other sectoral laws despite no inclusion of clear cut mandatory EIA clause. The Mines and Minerals Rules, 2000 obliges the proponent to adopt environmental protection measures and ensure environmental conservation. Similarly, Explosive Material Act, 2018, Public Road Act, 2031, Road Board Act 2002, Land Acquisition Act 2034 and Land Acquisition Regulations 2026, Local Self-Governance Act (1999) and Rules (2000), Buffer Zone Management Regulation 1996, Himalayan National Park Regulations, 1979 also emphasize EIA provisions.

National Adaptation Plan of Action (NAPA) and Local Adaptation Plan of Action (LAPA): National Adaptation Program of Action (NAPA) was developed by Nepal in 2010. It was developed as a requirement under the UNFCCC to access funding for the most urgent and immediate adaptation needs from the Least Developed Countries Fund (LDCF). In the NAPA, nine integrated projects have been identified as the urgent and immediate national adaptation priority. They are:

1. Promoting community-based adaptation through integrated management of agriculture, water, forest and biodiversity sector,
2. Building and enhancing adaptive capacity of vulnerable communities through improved system and access to services related to agriculture development,
3. Community-based disaster management for facilitating climate adaptation,
4. GLOF monitoring and disaster risk reduction and forest and ecosystem management for supporting climate-led adaptation innovations,
5. Adapting to climate challenges in public health and ecosystem management for climate adaptation, and
6. Empowering vulnerable communities through sustainable management of water resource and clean energy support and promoting climate smart urban settlement.

This was followed by development of National Framework on Local Adaptation Plan for Action (LAPA) in 2011. The Framework envisages that climate adaptation and resilience are integrated into local and national planning. Bottom-up, inclusive, responsive and flexibility are the four guiding principles pursued by the LAPA. The LAPA framework promises to support the following activities from local to national level planning:

1. Identify the most climate vulnerable Village Development Committee (VDC), Municipality, wards and communities and their adaptation challenges and opportunities, including possible activities,
2. Identify and prioritize adaptation actions in easy ways whereby local communities make the prioritization decisions about their needs,

3. Prepare Local Adaptation Plans for Action and integrate it into local and national plans in accordance with the Local Self-Governance Act,
4. Identify and mobilize appropriate service delivery agents and necessary resources for the implementation of the Local Adaptation Plans for Action,
5. Adopt and/or implement adaptation actions sequentially by the service providers in a timely and resource efficient manner,
6. Conduct monitoring and evaluation by ensuring effective implementation of the plan for action; and
7. Identify cost-effective adaptation alternatives for scaling up into local and national planning.

It aims to identify local adaptation needs that focus on reducing local climate risks and vulnerabilities and increasing resilience. Rather than creating new one, it emphasizes on using existing mechanisms to develop community adaptation planning in support of the most vulnerable communities and people. The process was started by sensitizing local communities on climate change issues accompanied by enhancing the capacity of more than 500 local facilitators/community practitioners on vulnerability assessment and adaptation planning.

Annex 2: Review of Relevant National and International Policies and Regulations related to Social and Environmental Safeguards for Implementation of the REDD+ Strategy

1. Land Acquisition, Compensation and Resettlement

The Interim Constitution of Nepal 2063 (2007)

Article 19 of the Interim Constitution (2063 (2007)), Right to Property, states that (1) "Every citizen shall, subject to the laws in force, have the right to acquire, own, sell and otherwise dispose of the property. (2) The State shall not, except in the public interest, requisition, acquire, or create any encumbrance on the property of any person. Provided that this clause shall not be applicable on property acquired through illegal means. (3) Compensation shall be provided for any property requisitioned, acquired or encumbered by the State in implementing scientific land reform program or in public interest in accordance with law. The compensation and basis thereof and operation procedure shall be as prescribed by law."

Land Acquisition Act, 2034 (1977)

The Land Acquisition Act (LAA), 2034 (1977), first promulgated in 1961 (Land Acquisition Act, 2018) is the overarching policy governing land acquisition and resettlement activities in Nepal. Government can acquire land at any place in any quantity by giving compensation to the land owner pursuant to the Act for any public purposes or for operation of any development project initiated by government institutions. Like many countries, Nepal does not have an explicit national involuntary resettlement policy or Act. Nonetheless some of the key requirements of involuntary resettlement are addressed by LAA. The LAA stipulates the process, procedures and timeframe as well as administrative responsibilities in acquiring private properties (for example, land, house, crops and others) for public purpose. It does not, however, state any provisions for physical resettlement and livelihood restoration of the affected population. The compensation for the land and property is determined by a Compensation Fixation Committee (CFC) formed under the chairmanship CDO. The mode of compensation is in cash after deducting the depreciation of the property. This has been the law being followed in public capital investments since its issuance. However, Clause 27 of the Act provides provisions for land acquisition through the mutual agreement with the plot owners, where the process of land acquisition as per Act is not required. The Act grants the plot owner the right to choose between a mutual agreement and the formal process for land acquisition as per the Act.

Land Reform Act, 1964

Another key legislation in Nepal related to land acquisition is the Land Reform Act (LRA) 2021 (1964). This Act establishes the tiller's right on the land, which he/she is tilling. The LRA additionally specifies the compensation entitlements of registered tenants on land sold by the owner or acquired for the development purposes. The most recent Act Amendment (2001) established a rule that when the State acquires land under

tenancy, the tenant and the landlord will each be entitled to 50 percent of the total compensation amount. Tenants are verified through a record of tenancy at the Land Revenue Office.

Guthi Corporation Act, 1976

Land acquisition must also comply with the provisions of the Guthi Corporation Act, 2033 (1976). Section 42 of this Act states that Guthi (religious trust land) acquired for a development must be replaced with other land, rather than compensated in cash.

Forest Act, 1993

The Forest Act, 1993 recognizes the importance of forests in maintaining a healthy environment. Section 49 of the Act prohibits reclaiming lands, setting fires, grazing, removing or damaging forest products, felling trees or plants, wildlife hunting and extracting boulders, sand and soil from the National forest without prior approval. Clause 68 (1) of the Forest Act 2049 (1993) states that the government may permit the use of any part of government-managed forest, leasehold forest or community forest, if there is no alternative for the implementation of a plan or project of national priority without significantly affecting the environment. According to the clause 68 (2), if any loss to persons or community is involved while permitting use of such land, it is required to compensate the loss.

Water Resources Act, 1993

The main objective of the Water Resources Act is to make legal arrangements for determining beneficial uses of water resources, preventing social, environmental and other hazardous effects thereof and also for keeping water resources free from pollution.

Section 16 has a provision for land acquisition from government or public for the construction of a water resource projects. If the project has been performed by Government of Nepal or a licensee, Government of Nepal may prohibit to use the premises of a house or land located in the area where such construction work is performed or the premises of a house or land located in the prescribed distance from such place of construction by any other person for any specified purpose. Government of Nepal or the licensee shall pay compensation, as prescribed under Land Acquisition Act, 2034(1977) to the concerned person for such damage or loss caused due to such prohibition.

Local Self-Governance Act, 1999

The Clause 258 in the Part – 5, General Provisions relating to Local Body Chapter – 3, Miscellaneous has provision of land acquisition. The Clause states that in case the Local body has to acquire land to carry out any development and construction works within its area, it may acquire the land required for that work by following the requirements of the prevailing law and providing compensation to the concerned land-owner for the land.

The LSGA gives local bodies called VDCs, Municipalities and DDCs the right to sell forest resources to generate income from within their boundary.

<u>WB Policy on Involuntary Resettlement (OP 4.12)</u>

The REDD+ project does not envisage any involuntary resettlement and involuntary land acquisition. However OP 4.12 will be applicable in case there is involuntary land taking resulting in displacement of people and / or loss of livelihood or source of livelihood. In such circumstances OP 4.12 will be triggered. OP 4.12 recognizes that involuntary land taking resulting in loss of shelter, assets or access and income or sources of income should be addressed by the project.

Absence of legal title to land should not be a bar for compensation, resettlement, and rehabilitation assistance. Both physical and economic displaced persons should be meaningfully consulted, given opportunities to participate in planning and implementing resettlement programs and assisted in their efforts to improve their livelihoods and standards of living. Vulnerable groups such as indigenous people, women-headed households, and senior citizens should be entitled to special benefit package in addition to compensation and resettlement.

WB Policy on Cultural Property (OP 4.11)

The World Bank Policy OP/BP 4.11 defines physical cultural resources as movable or immovable objects, sites, structures, groups of structures, natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Physical cultural resources may be located in urban or rural settings, and may be above or below ground, or under water. Their cultural interest may be at the local, provincial or national level, or within the international community.

The Bank assists countries to avoid or mitigate adverse impacts on physical cultural resources from development projects that it finances. The impacts on physical cultural resources resulting from project activities, including mitigating measures, may not contravene either the borrower's national legislation, or its obligations under relevant international environmental treaties and agreements. The borrower addresses impacts on physical cultural resources in projects proposed for Bank financing, as an integral part of the environmental assessment (EA) process.

2. Safeguard of Indigenous Peoples (IPs) and other Vulnerable Communities

The Interim Constitution of Nepal 2063 (2007)

The Interim Constitution of Nepal commits GoN for the protection and development of IPs and other marginalized communities. Article 21, Right to Social Justice guarantees the rights of the economically, socially or educationally backward women, Dalits, indigenous peoples, Madhesi communities, oppressed classes, poor farmers and labors to take part in the structures of the State on the basis of the principle of 'proportional inclusion'. Similarly, Article 35, Policies of the State (10) states that the State has compulsory obligation to pursue a policy of uplifting the economically and socially backward indigenous peoples, Madhesi, Dalit, marginalized communities, and workers and farmers living below the poverty line, by making a provision of reservation in education, health, housing, food sovereignty and employment, for a certain period of time.

The Tenth Five Year Plan (2002-2007) & Three Year Interim Plan (TYIP) (2007-2010)

Emphasis has been put on delivering basic services to the disadvantaged and indigenous people, Dalits, women, disabled and other vulnerable groups including the Adivasi / Janajati in the Tenth Plan. One of the

main thrusts of the Tenth Plan is the implementation of targeted programs for the uplift, employment and basic security of Dalits, indigenous people and disabled peoples. The policy provision also outlines that the government should pilot strong and separate package of program of basic security for vulnerable sections of society. GoN's five year periodic plan is the guiding policy document for any development project

Similarly, the Three Year Interim Plan (TYIP) (2007-2010) emphasized for inclusion of Adivasi/janajatis and other vulnerable groups through creating an environment for social inclusion; ensuring participation of disadvantaged groups in policy and decision making; developing special programs for disadvantaged groups; positive discrimination or reservation in education, employment, etc.; protection of their culture, language, and knowledge; proportional representation in development; and making the country's entire economic framework socially inclusive.

Three-Year Plan (2009/10 - 2012/13)

The plan adopts inclusive and equitable development strategy to uplift the living standard of the excluded groups, Dalit, Madhesi, Adibasi/Janajati, women, people with disability and remote geographical areas and poor people of the various regions of the country from the prevailing discriminatory practices in the society.

One of the strategies of its Social Development Policy is to increase the accessibility of socially, economically and geographically deprived class, region and community in the available resources by empowering them through the principles of equity and inclusion.

One of the priorities of the plan to increase investment to support development by promoting inclusion of excluded communities, region and gender in all structure, sector and processes of the nation.

National Foundation for the Development of Indigenous Nationalities (NFDIN) Act, 2058 (2002)

The GoN decreed the NFDIN Act in 2002 which was the basis to establish National Foundation for the Development of Indigenous Nationalities (NFDIN). The act defines indigenous groups or Adivasi Janajati in Nepali as "a group or community having its own territory, own mother tongue, traditional rites and customs, distinct cultural identity, distinct social structure and written or unwritten history". The government, through NFDIN, has identified and officially recognized 59 such indigenous communities. This list was updated in 2009 to include 81 groups for official recognition but yet to be approved by the GoN.

The indigenous people in Nepal are not homogenous and there is vast disparities existed in terms of socio-economic standing among them. Accordingly Nepal Federation of Indigenous Nationalities (Adivasi/ Janajati) (NEFIN) has grouped 10 of the 59 Adivasi/ Janajati as "endangered", 12 "highly marginalized", 20 "marginalized", 15 "disadvantaged" and 2 as "advanced" or better off on the basis of a composite index consisting of literacy, housing, landholdings, occupation, language, graduate and above education, and population size.

The NFDIN established the first comprehensive policy and institutional framework regarding indigenous peoples. It has been working for the preservation of the languages, cultures, and empowerment of the marginalized ethnic nationalities. More specifically, the NFDIN has been working to achieve the following objectives:

1. To make overall development of the *Adivasi/Janjati* by formulating and implementing the social, educational, economic and cultural programs.
2. To preserve and promote the language, script, culture, literature, arts, history of the *Adivasi/Janjati.*
3. To preserve and promote the traditional knowledge, skill, technology and special knowledge of the *Adivasi/Janjati* and to provide assistance in its vocational use.
4. To encourage the *Adivasi/Janjati* to be participated in the mainstream of overall national development of the country by maintaining a good relation, goodwill, and harmony between different *Adivasi/Janjati*, castes, tribes and communities.
5. To provide assistance in building an equitable society by making social, economic, religious and cultural development and uplifttment of *Adivasi/Janjati*.

Local Self-Governance Act, 1999

The Local Self-Governance Act, 1999 commits local bodies for the promotion, preservation, and protection of language, religion, culture of indigenous people and their welfare in their respective areas. The Act empowers local bodies to formulate and implement periodical and annual plans within their own jurisdiction. Periodic plans integrate different thematic plans according to social, economic, environment, physical, financial, and institutional aspects. The Act provides local bodies to follow planned development programs and prioritized programs that can increase productivity, contribute to upgrading living standards, and generate income and employment opportunities for indigenous people and other vulnerable groups. The Act also requires that local programs provide direct benefits to women and disadvantaged groups, and use community groups in the planning and execution of development programs.

The Forests Act (1993), Forest Regulation 1995 and CF Guidelines

The Forests Act (1993) and forest regulation 1995 are the main legislative instruments to regulate community forestry and envisages various types of community based forest management modalities such as Leasehold Forestry (LF), Collaborative Forest Management (CFM), user group based watershed management and buffer zone forest management. The Act and regulations define Community Forest Users Groups (CFUGs) as self-sustained and perpetual entities and have given absolute rights to CFUGs in managing their community forests. The regulatory provisions authorize CFUGs to formulate their own rules, enforce and sanction as appropriate. The constitution of a CFUG is a key regulatory document that defines decision making and benefit sharing mechanisms within the FUG as well as rights and responsibilities of different user members and forums. Within the legal framework defined by the rules, the CFUGs hold regular meeting, prepare and amend rules, allocate annual budget for overall forest development including different local development initiatives. Some social safeguard related provisions are as follows:

Forest Act 1993

- Land ownership remains with the state, while the land use rights belong to the CFUGs
- User groups are recognized as independent, self-governing, autonomous and corporate body with perpetual succession.
- All management decisions (land management and forest management) are taken by the CFUGs.
- Each household is recognized as a unit for the membership and every member has equal rights over the resources.
- There are mutually recognized use-rights.
- Equitable distribution of benefits.

- CFUGs can accumulate their fund from grant received by GoN and other local institutions, sale of CF products and amount received by other sources such as fine, etc. CFUGs can use their funds in any kind of community development works.

Forest Rules 1995

- User groups are allowed to plant short-term cash crops like NTFPs such as medicinal herbs.
- User groups can fix prices of forestry products for their own use.
- CFUGs can transport forest products under their jurisdiction anywhere in the county.
- In case of forest offences, CFUGs can punish their members according to their constitution and operational plan.

As per the provision of second revision of CF guidelines 2000, GoN has made the wellbeing ranking mandatory process while preparing CFUG constitution. As a result, the CFUGs need to identify the poorest households through wellbeing ranking based on the locally developed criteria and required to implement poverty reduction and marginalized group focused activities. These include – distribution of community lands to the landless or near-landless members, so that they can earn the living with cultivation of rewarding medicinal herbs or raising other crops. Several groups provide preference to poor members or women for placing them locally created jobs, such as for processing of handmade paper, working as nursery laborer, etc. (Subedi, 2006).

The National Dalit Commission (DNC) (2002)

The NDC was first constituted in 2002 by executive order of the Government of Nepal for the protection of their rights and inclusion in the mainstream of development. The main objectives of DNC are:

- To increase the active participation of socially, economically, politically, educationally most backward Dalit Community in the mainstream of national development by preserving and augmenting their fundamental rights provisioned in the prevalent law and constitution
- To create the environment favorable to Dalit community to enjoy the equal rights, self-esteem, services and privileges as equal as other social groups in the Nepal's human development Index.

However, it is yet to be made capable and powerful with efficient human resource and institutional empowerment by legally and financially to achieve the objectives entrusted by executive order for its formation.

Labor Act, BS 2048 (1992)

This Act classifies those persons younger than 15 years as children and those between the ages of 15 and 18 as ''Nabalik.' The act specifies that working hours for Nabalik and women must be between 6 a.m. and 6 p.m. and prohibits night working hours for women. Children are prohibited from working.

The Act also states that equal opportunity shall be given to women as that of men. Regular work hours for other employees must not exceed 8 hours in a day and 48 hours in week. For work conducted beyond that period, over time allowances must be paid at the rate of 150% of the normal hourly wages, not to exceed 4 hours each day. According to this act, employee wage rates shall not be less than the rate fixed by the concerned GoN offices.

National Parks and Wildlife Conservation Act, 1973

The Act restricts entry in national park area without prior permission. Hunting of animals and birds, build or occupy any houses, shelter or structures, occupy, clear or plant or grow any part of land, cut, fell, remove overshadow any tree, remove any quarry or any other activities are banned.

This Act provides provision (4th amendment in 1993) for the government to declare national parks, reserves or conservation areas as well as declare peripheral areas of a national park or reserve as buffer zones. The Act and other Rules framed under this Act provide provision for benefit sharing. About 30 to 50 percent of the total benefits generated from national parks and wild life conservation should be provided for community development activities in the declared buffer zone areas. It also prioritizes people's participation for the management of protected areas to reduce park-people conflicts.

Buffer Zone Regulations, 1996

These provide park authority and local users to design programs for the buffer zone that are compatible with the national park management. It allows investing 30-50% of the park-generated revenues for community development activities in buffer zone. It promotes activities that meet the basic needs of local people for firewood, fodder, timber, and grazing. Following activities are prohibited:

- Occupying any land without legal ownership or cutting trees, clear forest or cultivate forestland
- Any activity damaging forest resources or setting fire in the forest
- Excavating stone, earth, sand or mine or removing minerals, earth or other such materials
- Using any harmful poison or explosive substances into the river, stream or source of water flowing in the buffer zone
- Hunting illegally and any act of damaging to the wildlife

Climate Change Policy (2010)

The main goal of this policy is to reduce adverse impact of climate change, develop adaptation and mitigation mechanism and reduce carbon greenhouse gas (GHG) emission. Objectives of the policy are implementation of climate change adaptation program and mitigation measures for adverse impacts and enhancement measures for beneficial impacts and promotion of renewable and alternative energy and green technology. It also advocates for strengthening capacity of local people for the climate change adaption to promote livelihood of vulnerable people by maximizing opportunities from international climate change related conventions.

Forestry Sector Policy (2000)

This policy is an updated version of the Forestry Sector Master Plan policy and subsequent amends to that document. It contains development imperatives, strategies, and programs and summarizes the investment required to develop the forestry sector. This policy highlights the implementation of community and private forestry development programs, national parks and conservation areas management programs, soil and watershed conservation program, management and development of medicinal plants, and conservation of biological diversity and endangered species. Moreover, it emphasizes to avoid forest destruction or tree cutting while constructing infrastructures during implementation of project other than forestry sector

GoN Policies on Gender Mainstreaming

The Government of Nepal (GON), since the early 1990s, has been making significantly increasing commitments to gender equity, equality and the empowerment of women in its policies, plans and programs. The GON introduced a Gender Approach to Development (GAD) in 1990, to enable women and men to participate equally in public and private life and realize their full potential in development. The Tenth Plan (2002-2007) as a Poverty Reduction Strategy Paper (PRSP) identified gender and inclusion as its main strategies for reducing poverty. 'Social inclusion and targeted programs' was one of the four major pillars of the Tenth Plan/PRSP. The Plan, instead of relying only on targeted programs, tried to address gender and caste related issues by mainstreaming all of the four pillars of PRSP along with envisaged strategies to achieve gender equality and empowerment of women. The Three Year Interim Plan (TYIP) [2008-2010]), which emphasizes post conflict reconstruction, rehabilitation and reconciliation, continued the long-term goal of poverty reduction through gender mainstreaming and social inclusion.

Review Guidelines for EIA and IEE of Forestry Sector (2002) and IEE Manual for Forestry Sector (2005)

The Ministry of Forests and Soil Conservation (MFSC) prepared and used Review Guidelines for IEE and EIA of Forestry Sector, 2002 and IEE Manual for Forestry Sector, 2005. They provide procedures to prepare quality EA (includes physical, chemical, biological, social, economic and cultural aspects) reports, by identifying and predicting impacts and evaluating their significance, preparing practical environmental management plan, and process for conducting environmental monitoring and auditing as an integral part of EIA. These instruments have made a solid foundation to ensure environmental and social safeguards in forests and forest-related development programs and projects.

Buffer Zone Management Guidelines, 1999

These outline procedures for managing buffer zones including the formation of user groups, user committees, buffer zone management committee, disbursement of revenue, and settlement of compensation. Buffer zones have been developed in order to focus on the special needs of local communities that are likely affected by conservation measures. The main responsible body for overall conservation and development in the buffer zone include user group, user committees, and buffer zone management committee and council.

Wildlife Damage Relief Guideline, 2009

This is prepared to provide relief of human and livestock casualty, crop, house and shed damage to the victims due to the wildlife. Providing relief procedures are mentioned in this guideline. In definition, victim is eligible to get relief from the damage caused by Elephant, Rhinoceros, Tiger, Snow Leopard, Leopard, Arna and Bear. However, there is confusion about Wild Boar, Python and Crocodile as they are also mentioned in preamble. There is also provision of Relief Distribution Recommendation Committee in each district.

National Adaptation Program of Action, 2010

The National Adaptation Program of Action (NAPA) has been instrumental in mainstreaming climate change in development planning. Nepal has prepared the National Adaptation Program of Action (NAPA) which was endorsed by the government in September 2010. The NAPA has developed a framework for adaptation program and has identified key adaptation needs, existing adaptation practices and options for developed projects. It has following nine priorities:

(a) Promoting community-based adaptation through integrated management of agriculture, water, forest, and biodiversity;

(b) building and enhancing adaptive capacity of vulnerable communities through improved systems and access to service for agricultural development;
(c) community based disaster management for facilitating climate adaptation;
(d) GLOF monitoring and disaster risk reduction;
(e) forest and ecosystem management for supporting climate led adaptation innovations;
(f) adapting to climate change in public health;
(g) ecosystem management for climate adaptation;
(h) empowering vulnerable communities through sustainable management of water resources and clean energy supply; and
(i) promoting climate-smart urban settlements.

International Labor Organization (ILO) Convention (169), 1989

Article 4.1 of the ILO Convention commits government of signatory countries to adopt special measures as appropriate for safeguarding the persons, institutions, property, labour, cultures and environment of the peoples concerned.

In applying the provisions of this Convention, the article 6.1 prescribes that governments shall consult the peoples concerned, through appropriate procedures and in particular through their representative institutions, whenever consideration is being given to legislative or administrative measures which may affect them directly.

The article 6.2 says about the process of consultation and states that the consultations carried out in application of this Convention shall be undertaken, in good faith and in a form appropriate to the circumstances, with the objective of achieving agreement or consent to the proposed measures.

As per the article 7.1 of the Convention, the peoples concerned shall have the right to decide their own priorities for the process of development as it affects their lives, beliefs, institutions and spiritual well-being and the lands they occupy or otherwise use, and to exercise control, to the extent possible, over their own economic, social and cultural development.

The article 7.3 mentions requirement to assess the likely impacts of any development interventions on indigenous people. It states that Governments shall ensure that, whenever appropriate, studies are carried out, in co-operation with the peoples concerned, to assess the social, spiritual, cultural and environmental impact on them of planned development activities. The results of these studies shall be considered as fundamental criteria for the implementation of these activities.

United Nations Declaration on the Rights of Indigenous Peoples, 2007

The goal of the Declaration is to encourage member countries to work alongside indigenous peoples to solve global issues, like development, multicultural democracy and decentralization. Articles 1-4 of the Declaration sets out the individual and collective rights of indigenous peoples, as well as their rights to culture, identity, language, employment, health, education and other issues. The Article 5 emphasizes the rights of indigenous peoples to maintain and strengthen their own institutions, cultures and traditions and Article 23 encourages them to pursue their development in keeping with their own needs and aspirations. The Article 21 prohibits discrimination against indigenous peoples. Articles 25-30 describe process and procedures to promote their full and effective participation in all matters that concern them and their right to remain distinct and to pursue their own visions of economic and social development.

WB Policy on Indigenous People (OP 4.10)

This policy states that any development process under the Bank finance should fully respect the dignity, human rights, economies, and cultures of Indigenous Peoples. Project should engage in a process of free, prior, and informed consultation with IPs that should result in broad community support to the project by the affected Indigenous Peoples.

Projects should include measures to avoid potentially adverse effects on the Indigenous Peoples' communities or when avoidance is not feasible, minimize, mitigate, or compensate for such effects. Project should ensure that the Indigenous Peoples receive social and economic benefits that are culturally appropriate and gender and inter-generationally inclusive.

3. Good Governance, Social Accountability and Public Consultation

Right to Information Act, 2064 (2007)

The aim of this act is to make the functions of the state open and transparent in accordance with the democratic system and to make responsible and accountable to the citizen. It intends to make the access of citizens simple and easy to the information of public importance held in public bodies and to protect sensitive information that could make adverse impact on the interest of the nation and citizen.

The clause 3 of the act ensures Right to Information. It says that every citizen shall, subject to this Act have the right to information and they shall have access to the information held in the public Bodies unless confidentiality has been maintained by laws.

The clause 4 of the act describes the Responsibility of a Public Body to disseminate information. It mentions that each Public Body has to respect and protect the right to information of citizen.

The clause 7 of the act prescribes the Procedures of Acquiring Information. It states that a Nepali Citizen, who is interested to obtain any information under this Act, shall submit an application before concerned Information Officer by stating reason to receive such information.

Good Governance (Management and Operation) Act, 2064 (2008)

This act intends to make legal provision in relation to good governance by making public administration of the country pro-people, accountable, transparent, inclusive and participatory.

The clause 30 of the act has a provision of public hearing. The Chief office-holder at regional, zonal, district and local level involved in delivery of service, shall conduct **Public Hearing** as prescribed, with the purpose of making the activities of the office fair, transparent, and objective and addressing the lawful concerns of general people and stakeholders. The act also mentions that subject matter expert, stakeholders, and representatives of civil society and officials of the local bodies shall be the participants of the public hearing. Similarly, the clause 31 of the act describes **Grievance Management Process**.

The Forests Act (1993) and Forest Regulation 1995

The community based forestry program (CBFP) is being implemented under the Forest Act (1993) and Forest Regulation (1995). Now CBFP is not taken as just a government program offering some services to people; it is owned and actively sustained by citizens – who are organized as Community Forest User Groups (CFUGs). The CFUG governance is defined by their Constitution and community forest management Operational Plan (OP). The constitution is registered in the District Forest Office (DFO). While there are certain standards, guidelines and norms for the group constitutions, each CFUG prepares its own constitution defining the social arrangement and the responsibilities and rights of the group (which may vary from group to group to adapt

the local tradition, culture and practices) as well as an OP specifying how the forest is managed and utilized. OP also serves as an agreement between the DOF and the CFUG.

Similarly, the Community Forest Guidelines 2001 suggests for a thorough discussion at tole (hamlet) level in order to encompass the needs and interest of the poor, women and destitute sections of the community while preparing forest management plan or revising it.

Likewise, the Forestry Sector Gender and Social Inclusion Strategy (2006) has also aimed at guiding all the forestry sector stakeholders to promote the inclusion of poor and socially excluded group of people in CF. Furthermore, Ministry of Forests and Soil Conservation (MFSC) has declared its Gender, Poverty, Social Equity (GPSE) Vision for 2020 which clearly stated and committed that the ministry is a gender and social equity sensitive and socially inclusive organization, practicing good governance to ensure equitable access to, benefits from, and decision-making power over, forest resources and benefits of all Forestry sector stakeholders.

Environment Protection Rules, 2054 (1997)

The Environment Protection Rules (EPR), 1997 provides the detail provisions to conduct public consultation and feedback. The different sections of EPR, 1997 relevant to the public consultation and disclosure are described below.

Rule 4: Proposal requiring EIA will have to prepare a scoping document incorporating the public concerns and apply to MoEST through concerned agencies. In this process a 15 days public notice in the national newspaper requesting suggestions and comments on environmental and social issues arising due to the proposal implementation has to be published. The MoEST is empowered to review the document and give approval with or without needed amendments.

Rule 5: Proponent of both IEE and EIA proposals has to prepare Terms of Reference (ToR) of the proposal for approval incorporating the concerns and suggestions of the stakeholders.

Rule 7: Proponents of the EIA proposal has to organize a public hearing in the project affected area to collect public concerns and suggestions and address the concerns and suggestions in the EIA report.

Rule 11, Sub-rule 2, 3, and 4: Ministry of Environment, Science and Technology (MOEST) upon receipt of the EIA shall disclose the EIA report through public notice in any one of the daily newspaper, granting a time limit of thirty days, to the general public to make a copy of the report or to study it for offering their opinions and suggestions to the Ministry within 30 days of the notice publication.

Rules 45 to 48 elaborate the provision for compensation and addressing the grievances. In case anyone wishes to realize compensation from any individual, institution or proponent under section 17 of the Act, s/he may submit an application to the concerned Chief District Officer (CDO) mentioning the type of loss and the amount of compensation sought. In such application, CDO shall conduct investigation, evaluate the actual loss and shall determine appropriate and reasonable amount of compensation accordingly. In case of difficulty in evaluating the compensation, CDO may seek guidance from the concerned body. The proponent shall pay the amount to the concerned individual or institution within 30 days from the date of determination of the amount. Failure to pay the amount of compensation within the prescribed time limit, CDO shall take action to pay from the property of the individual, institution or proponent in accordance with the existing laws.

Land Acquisition Act, 2034 (1977)

The Land Acquisition Act, 2034 (1977) has detail provisions for public notification and feedback. The different clauses of LAA, 1977 relevant to the public notification and disclosure are described below

Clause 9 of the LAA empowers the Chief District Officer (CDO) for public notification, with details of the affected property. The notification with required details is to be published in the notice boards of Project Site Office, District Development Office, Concerned Village Development Office or Municipality Office, Land Administration Office, Land Revenue Office, or any place close to the land and property acquisition sites. And, if the CDO feels that any concerned party might not be informed by the public notice, then he may inform him/her personally with other details. Land Revenue office is mandated to stop registration of the notified land and property till further notice by the CDO.

Clause 10 of the LAA describes the facts to be included in the public notice of Clause 9 such as: the documents required and the time to apply for the compensation; the time period within which the standing crops, structures etc. could be managed by the concerned party, etc.

As per Clause 11 of the Land Acquisition Act, 2034 (1977), any grievances and objections will be referred to the Grievances Redress Committee (GRC). The Act assigns the CDO as the sole responsibility to chair land acquisition activities and to address the grievances related to the land acquisition and compensation. According to Clause 11, any grievance to disable land and property acquisition could be reported to Home Ministry within 7 days of public notification by CDO. Home Ministry is required to decide on the grievances within 15 days of the receipt of the grievances. On deciding the grievances, Home Ministry is authorized in as much capacity as the district court to consult the local authority or, ask for necessary documents or, consult witnesses.

Annex 3. List of policy and legal instruments[32] in the forestry sector

National Forest including community, leasehold and private forest management

Revised Forestry Sector Policy 2000
Leasehold Forest Policy 2002
Forest Act 1993
Forest Regulations 1995
Forest fire management strategy 2010
Forest Encroachment control strategy 2008
Community Forestry Directive 1995 (1st amendment 1999)
Guideline for Inventory of Community Forests 2004
Guidelines for Community Forestry Development Program 2008 (revised)
Forest Carbon Measurement Guideline 2011
Collaborative Forest Management Directives 2011
Formation and Operational Directives on DFSCC, 2011
Procedure for handing over Leasehold for commercial purpose and poor families 2011
Presidential Churia Conservation Program Directives 2011

Conservation of ecosystem, biodiversity and genetic resources

National Wetland policy 2012
National Park & Wild Life Reserve Act, 1973
National Park and Wildlife Conservation Regulation 1974
Chitwan National Park Regulation 1974
Wildlife Reserve Regulation 1977
Himalayan National Park Regulation 1979
Khaptad National Park Regulation 1987
Bardiya National Park Regulation 1996
Buffer Zone Management Regulation 1995
Conservation Area Management Regulation 1996
Conservation Area Government Management Regulation 2000
Kanchnajhangha Conservation area Management Regulation 2007.
National Biodiversity Strategy Action Plan 2014
Wildlife farming breeding and research procedure 2003
Procedures for handing over the management of Protected Areas to NGOs and other organizations 2003

[32] Legislative instruments refer the constitution, acts, regulations, directives and associated guidelines, however guidelines are only the good practices guidance and they have no legally binding status.

Procedure for handing over the land of protected areas for infrastructure development 2008
Wildlife Compensation Directives, 2009
Tarai Arc Landscape (LAL) strategic plan (2004-2014)
Sacred Himalyan Landscpae (SHL) - Strategic Plan (2006-2016)
Species conservation action plans

Soil and watershed management
Soil and Watershed Conservation Act, 1982
National Action Program on Combatting Desertification 2003
Churia Area Program Strategy 2008

NTFPs/MAPs and wood based industries
Herbs and NTFP Development Policy 2004
Guideline for NTFP Based Enterprise 2005
Resin Collection (Procedure) Directives 2007
NTFP Inventory Guideline 2012
Forest Product (Timber/firewood) Collection and Sales Directives, 2000
Forest Product Auction Procedure Directives, 2003

Annex 4: Drivers of deforestation and forest degradation identified in various studies:

SN	Studies	Drivers identified	Summary of the underlying causes
1.	WWF/TAL (2003). (The Root Cause Analysis of Biodiversity loss at Tarai Arc Landscape)	1. Agricultural expansion 2. Forest fires 3. Unproductive cattle, overgrazing 4. Illegal timber trade 5. Collection of non-timber forest products 6. Fuel wood use	▪ Livelihood conditions ▪ Migration and natural population growth ▪ Common property resources ▪ Overlapping and contradictory legislation ▪ Liberalization policies ▪ Political instability/insecurity
2.	MFSC, 2010 (R-PP)	1. High dependency on forests and forest products (timber, firewood, and other NTFPs) 2. Illegal harvest of forest products 3. Unsustainable Harvesting Practices 4. Forest fire 5. Encroachment 6. Overgrazing 7. Infrastructure development 8. Resettlement 9. Expansion of invasive species	▪ Poverty and lack of livelihood alternatives; ▪ Weak governance mechanisms and weak law enforcement ▪ Inefficient distribution mechanism for timber and firewood ▪ High cross-border demand for forest products ▪ Inadequate budget for research and development ▪ Political interference ▪ Unclear land tenure, policy and planning
3.	WWF Nepal/ Hariyo Ban Program, 2012*	1. Land use alterations, 2. Forest encroachment, 3. Forest Fire, 4. Livestock grazing 5. Illegal logging and wildlife trade (poaching) 6. Human Wildlife Conflict 7. Invasive species 8. Infrastructure and 9. Climate induced threats	Not specifically identified
4.	UN-REDD/REDD Cell, (2014)	1. Illegal logging,	▪ Poverty and high dependency on

		2. Encroachment, 3. Fuel-wood consumption, 4. Roads, 5. Mining, 6. Grazing	forests; ▪ Increase demand for forest products; ▪ Weak low enforcement; ▪ Corruption ▪ Population growth ▪ Political instability ▪ Poor technology in forest management ▪ Low agriculture productivity
5.	Multi stakeholder consultations conducted for ER-PIN development at national and sub-national level (2013) *	1. Encroachment 2. Open grazing 3. Firewood collection 4. Resettlement and Infrastructure development 5. Illegal cutting of trees 6. Forest fires	▪ opulation growth and migration from hills ▪ Poverty ▪ Unemployment ▪ Political instability ▪ Weak law enforcement ▪ Lack of coordination among the various government agencies ▪ Floods ▪ Lack of resources in DFOs to control illegal activities ▪ Lack of land use policy ▪ Corruption
6.	Baral et al (2012) (High Mountain Areas)	1. Forest fire 2. Over grazing 3. Indiscriminate product extraction 4. Illegal trades 5. Infrastructure expansion 6. Development of new economic frontiers	▪ Demographic factors ▪ Policy and institutional factors ▪ Governance factors ▪ Economic factors ▪ Cultural factors ▪ Lack of research and development
7.	WWF Nepal/ Hariyo Ban Program, (2013) (Chitwan Annapurna Landscape)	**Churia:** 1. Over, and unsustainable harvesting 2. Encroachment of forestlands for agricultural expansion 3. Infrastructure development 4. Resettlement and urban expansion 5. Forest fire 6. Invasion by alien plant species 7. Overgrazing **Mid-Hills:** 1. Unplanned and unregulated opening of road tracks by local Village Development Committees	▪ High forest dependency ▪ Widespread poverty and very limited livelihood alternatives ▪ Weak law enforcement and overall poor forestry sector governance ▪ Lack of scientific forest management ▪ Financial and human resource constraints in district forest offices ▪ Poor coordination among different government and non-government agencies.

		2. Forest fire 3. Invasion by alien plant species 4. Stone mining and landslides **High Mountain:** 1. Forest fire 2. Overgrazing	
8.	ANSAB (2010) (In three watersheds of Dolakha, Chitwan and Gorkha)	1. Forest encroachment 2. Firewood collection for domestic and local purposes 3. Illegal wood harvest 4. Forest fire 5. Grazing 6. Over harvest of grasses and litter 7. Lack of forest management operations. 8. Infrastructure Development 9. Agricultural Expansion	▪ Demographic Factors ▪ Economic Factors ▪ Forest Management ▪ Governance Factors ▪ Policy Factors ▪ Socio-cultural Factors
9.	PSPL/FECOFUN, (2010)	**Tarai**: Gaps in demand and supply; Illegal logging; Encroachment; Settlement of landless; Forest fire; Invasion of invasive species; Use of land for other purposes **Churia**: Gaps in demand and supply; Illegal logging; Encroachment; Settlement of landless; Forest fire; Use of land for other purposes **Mid-hills**: Gaps in demand and supply; Forest fire; Use of land for other purposes **High-mountain:** Gaps in demand and supply; Forest fire; Use of land for other purposes; Illegal logging;	▪ High dependency on forest products ▪ Ineffective policies and implementation mechanisms ▪ Open access and tenure issues ▪ Governance issues ▪ Insufficient institutional set-up ▪ Poverty and unemployment ▪ Subsistence farming ▪ Political issues ▪ Migration etc

Annex 5. Direct drivers, their underlying causes, drivers for, affecting regions and corresponding relevant strategic actions

SN	Drivers	Underlying causes	Drivers for	Strategic Actions	Affecting regions
19.	Forest fire	▪ Weak Forest fire Management ▪ Inadequate human resource development and management ▪ Weak law enforcement	Forest degradation	▪ Promote community-based management models ▪ Intensify sustainable management of forest (SMF) ▪ Update and improve management plans with provisions fire management ▪ Enhance community participation and support for the control and management of forest fire. ▪ Strengthen fire control capabilities with fire management plans, fire-fighting capacity building, fire monitoring, fire fighting equipment and insurance mechanisms. ▪ Promote Integrated Conservations and participatory models in PAs ▪ Carry out forest zoning and phased transfer into different management modalities. ▪ Improve public awareness and education	HM (1)* MH (3) S (1) T (2)
20.	Over grazing/uncontrolled grazing	▪ Poor understanding of grazing and pasture ▪ Weak coordination and cooperation among stakeholders ▪ Non-recognition of customary practices	Forest degradation	▪ Promote community-based management models ▪ Intensify sustainable management of forest (SMF) ▪ Update and improve management plans with provisions of grazing control ▪ Enhance community participation and support for the control and management of grazing. ▪ Promote Integrated Conservations and participatory models in PAs ▪ Carry out forest zoning and phased transfer into different management modalities. ▪ Recognize customary forest and pasture management practices by including good practices into forest and pasture management plans	HM (1)* MH (4) S (1) T (1)

				▪ Improve public awareness and education ▪ Support to increase fodder and forage production ▪ Promote multi-purpose fodder management and stall feeding	
21.	Unsustainable harvesting and utilization of forest products (unregulated, illegal, poor technology)/Unsustainable harvesting	▪ Weak Forest Management practices ▪ Disproportionate population distribution and migration pattern ▪ Poverty and limited livelihood opportunities ▪ High dependency in forest products and gap in demand-supply ▪ Weak governance ▪ Inadequate human resource development and management ▪ Traditional technologies and use pattern	Forest degradation	▪ Intensify sustainable management of forest (SMF) ▪ Invest in sustainable forest-based enterprises ▪ Carry out forest zoning and phased transfer into different management modalities. ▪ Rehabilitate degraded land and shrublands ▪ Increase the supply of harvested wood products to substitute high-energy intensive metal products and reduce emission ▪ Increase awareness and capacities of all stakeholders ▪ Promote private forestry ▪ Develop efficient and alternative timber technologies ▪ Increase investment and promote fuel wood efficient and alternative energy technologies. ▪ Promote sustainable, cost-effective and affordable renewable energy sources ▪ Increase access to alternative energy technologies for forest-dependent poor and marginalized people. ▪ Promote and increase access to cost effective wood technologies for forest-dependent poor and marginalized communities. ▪ Re-structure institution and improve forest governance ▪ Develop functional collaboration and cooperation with security forces, media, and civil society to control illegal forest activities. ▪ Control cross-border illegal trade of forest products through inter-country cooperation ▪ Develop incentive and penalty system to address illegal harvesting and illegal trade ▪ Strengthen forest law enforcement to control illegal harvest and trade of forest products. ▪ Establish and strengthen grievance-addressing mechanisms that is gender-sensitive and respond to people's grievances and concerns	HM (2) MH (3) S (1) T (1)
22.	Weak Forest Management	▪ Weak implementation of	Forest	▪ Intensify sustainable management of forest (SMF)	HM (1)

	practices (unmanaged/under-managed)	policies ▪ Land use policy and insecure forest tenure ▪ Weak governance ▪ Inadequate human resource development and management ▪ Protection oriented mind-set ▪ Poor political will and commitment	degradation	▪ Update and improve management plans with provisions of carbon stock measurements and carbon monitoring methods ▪ Promote the landscape conservation and climate resilient approaches ▪ Increase awareness and capacities of all stakeholders ▪ Safeguard tenure security of forest user groups ▪ Increase and ensure access to forests, decision-making and benefits to women, Dalit, Indigenous People, vulnerable groups, forest dependent people, and other marginalized people ▪ Recognize the traditional and customary practices of forest management and incorporate in community-based forest management ▪ Develop and implement participatory M & E mechanisms ▪ Re-structure institution and improve forest governance ▪ Improve mind-set, competency, commitment and morale of forestry personnels ▪ Promote and support partnership among government, community, and private sector to enhance the performance of government and Local Forest User Groups.	MH (3) S (1) T (1)
23.	Unplanned infrastructure development (includes manmade disasters)	▪ Land use policy ▪ Conflicting policy and legislation ▪ Weak enforcement and monitoring for forest laws ▪ Disregard of forest and environment legislation by other govt agencies ▪ Weak coordination and cooperation among stakeholders	Deforestation	▪ Strengthen multi-stakeholder and integrated planning approach at various levels ▪ Harmonize contradictory cross-sectoral policies and legal frameworks issues ▪ Improve intra and inter policy coordination among different sectors ▪ Ensure environmental, social and economic measures in infrastructure development and maintenance ▪ Implement climate smart infrastructure planning, implementation and monitoring ensuring social and environmental safeguards. ▪ Avoid forest area for infrastructure development ▪ Ensure effective implementation and compliances of IEE and EIA for all types of forest land use conversions ▪ Adopt REDD+ international standards on participation, inclusion and Free, Prior, Informed Consent (FPIC). ▪ Promote increased use of GIS and remote-sensing/spatial planning applications	HM (2) MH (1) S (2) T (4)

				▪ Improve forest law enforcement ▪ Establish spatially explicit information systems on land use	
24.	Urbanization and resettlement	▪ Lack of scientifically informed land use policy ▪ Disproportionate population distribution and migration pattern ▪ Weak governance ▪ Weak law enforcement and monitoring ▪ Poverty and limited livelihood opportunities ▪ Poor coping strategy to natural disasters and climate change	Deforestation	▪ Develop and implement economic and market-based incentives packages to promote optimal land use ▪ Carryout planning with climate change vulnerability assessment ▪ Promote increased use of GIS and remote-sensing/spatial planning applications ▪ Support in the application of Sloping Agriculture Land Technologies ▪ Increase access to crop & livestock breeding and husbandry improvement programs ▪ Promote intensive agricultural practices and technology ▪ Promote development of policies supportive of small-scale sustainable agriculture	HM (5) MH (5) S (1) T (1)
25.	Encroachment	▪ Land use policy ▪ Population distribution and migration pattern ▪ Weak governance ▪ Weak law enforcement and monitoring ▪ Poverty and limited livelihood opportunities	Deforestation	▪ Enhance community participation and support for the control of encroachment. ▪ Promote increased use of GIS and remote-sensing/spatial planning applications ▪ Strengthen forest law enforcement to control encroachments ▪ Scale up investment in non-forestry sector employment programs and off-farm income generation activities targeting rural and urban (poor) ▪ Improve access to alternative technologies for forest dependent poor and marginalized communities. ▪ Design and implement off-farm income generation projects through vocational and skill training for forest-dependent poor and marginalized households ▪ Incentivize and support Forest User Groups to create incomes, livelihood options and job opportunities for forest dependent poor and marginalized communities.	HM (5) MH (5) S (1) T (1)
26.	Expansion of invasive species	▪ Lack of knowledge about control and management ▪ Weak Forest Management practices	Forest degradation	▪ Update and improve management plans with provisions of invasive species control ▪ Assess and implement remedial and preventive measures for the invasive alien species	HM (5) MH (4) S (1)

		▪ Inadequate policy		▪ Incorporate in monitoring indicators and establish community-monitoring systems in all community based management regimes	T (1)
27.	Mining /excavation (sand, boulders, stones).	▪ Lack of scientifically informed land use policy ▪ Conflicting policies ▪ Weak governance ▪ Weak law enforcement and monitoring	Deforestation and Forest degradation	▪ Enforce forest law to control haphazard mining and excavation Strengthen multi-stakeholder and integrated planning and implementation ▪ Harmonize contradictory cross-sectoral policies and legal frameworks ▪ Improve intra and inter policy coordination among different sectors ▪ Ensure effective implementation and compliances of IEE and EIA ▪ Ensure implementation of environmental, social and economic measures ▪ Adopt REDD+ international standards on participation, inclusion and Free, Prior, Informed Consent (FPIC). ▪ Establish cost effective mechanisms for monitoring, reporting and verification	HM (5) MH (3) S (1) T (1)

HM-High Mountain; MH- Middle Hills; S- Churia; T- Tarai and inner Tarai

1- Very high effect; 2- High effect; 3- Medium effect; 4- Low effect; 5-Very low effect

**Effect of forest fire and grazing in terms of exposure, sensitivity and capacity to address*

Annex 6. Relational table

The below table provides an overview of the relation between the *Consolidated framework structure for National REDD-plus Strategy of Nepal* ("Annex A") and this Strategy report. The left colum shows the (sub-) chapters of the *Consolidated framework structure for National REDD-plus Strategy of Nepal*, while the right column shows the corresponding (sub-) chapters of Part II in this report.

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