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Food and Agriculture Organization of the United Nations

GLOBAL FOREST RESOURCES ASSESSMENT

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The Forest Resources Assessment Programme

Sustainably managed forests have multiple environmental and socio-economic functions important at the global, national and local scales, and play a vital part in sustainable development. Reliable and up-to-date information on the state of forest resources - not only on area and area change, but also on such variables as growing stock, wood and non-wood products, carbon, protected areas, use of forests for recreation and other services, biological diversity and forests' contribution to national economies - is crucial to support decision-making for policies and programmes in forestry and sustainable development at all levels.

FAO, at the request of its member countries, regularly monitors the world's forests and their management and uses through the Forest Resources Assessment Programme. This country report forms part of the Global Forest Resources Assessment 2005 (FRA 2005), which is the most comprehensive assessment to date. More than 800 people have been involved, including 172 national correspondents and their colleagues, an Advisory Group, international experts, FAO staff, consultants and volunteers. Information has been collated from 229 countries and territories for three points in time: 1990, 2000 and 2005.

The reporting framework for FRA 2005 is based on the thematic elements of sustainable forest management acknowledged in intergovernmental forest-related fora and includes more than 40 variables related to the extent, condition, uses and values of forest resources. More information on the FRA 2005 process and the results - including all the country reports - is available on the FRA 2005 Web site (www.fao.org/forestry/fra2005).

The Global Forest Resources Assessment process is coordinated by the Forestry Department at FAO headquarters in Rome. The contact person for matters related to FRA 2005 is:

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1 Table T1 – Extent of Forest and Other wooded land

1.1 FRA 2005 Categories and definitions

Category	Definition
Forest	Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds *in situ*. It does not include land that is predominantly under agricultural or urban land use.
Other wooded land	Land not classified as "Forest", spanning more than 0.5 hectares; with trees higher than 5 meters and a canopy cover of 5-10 percent, or trees able to reach these thresholds *in situ*; or with a combined cover of shrubs, bushes and trees above 10 percent. It does not include land that is predominantly under agricultural or urban land use.
Other land	All land that is not classified as "Forest" or "Other wooded land".
Other land with tree cover (Subordinated to "Other land")	Land classified as "Other land", spanning more than 0.5 hectares with a canopy cover of more than 10 percent of trees able to reach a height of 5 meters at maturity.
Inland water bodies	Inland water bodies generally include major rivers, lakes and water reservoirs.

1.2 National data

Department of Forest Research and Survey is the only government organization that works in close collaboration with various national stakeholders and international agencies and deals with designated forest research and survey in Nepal. The Forest Survey Division of the Department generates valuable statistics and information necessary to plan overall forestry development at national, regional and district level.

The latest National Forest Inventory (NFI) spanned a period of 1988 to 1998 and its reference year is 1994.

1.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
DFRS, 1999. Forest Resources of Nepal (1987-1998). Department of Forest Research and Survey, Ministry of Forest And Soil Conservation, Kathmandu, Nepal	H	Area of forest and shrub	1994	NFI from 1988 to 1998.
HMGN/ADB/FINNIDA, 1988. Master Plan for the Forestry Sector in Nepal. Ministry of Forest and Soil Conservation, Kathmandu, Nepal.	H	Area of forest and shrub	1985-86	Based on Land Resources Mapping Data of 1978/79
WECS, 1988. District, Regional and national Forest Cover Class Summaries of the Area, Fuelwood Yield and Wood Volume for the Kingdom of Nepal. Water and Energy Commission Secretariat, His Majesty's Government of Nepal.	H	Area of forest and shrub	1985-86	Based on Land Resources Mapping Data of 1978/79
FAO. 2001. Global Forest Resources Assessment 2000. Main Report FAO Forestry Paper 140. FAO, Rome, Italy.	H	Global Forestry Statistics	2000	

1.2.2 Classification and definitions

The following table provides the classification and their definitions in use at Department of Forest Research and Survey, Ministry of Forests and Soil Conservation, Nepal.

National class	Definition
Forest	All land with a forest cover, i.e, with trees whose crowns cover more than 10 % of the area, and not used primarily for purposes other than forest. Temporarily clear-cut area that will be planted is also forest area.
Shrub	Same as *Forest* but well-defined stem can't be found

Source: DFRS, 1999.

1.2.3 Original data

The following table presents the national data on forest cover in Nepal. These information are based on The National Forestry Inventory Report prepared by the DFRS.

Categories	Land Cover in 000 ha			
	LRMP 1978/79	**NRSC 1984**	**MPFS 1985/86**	**NFI 1994**
Forest	5593	5284*	5504	4268
Shrub	692	-	706	1560
Total	6285		6210	5828

* include some shrub areas

1.3 Analysis and processing of national data

1.3.1 Calibration

Since the total country area (14718 “000” ha) matches with FAO statistical figures (FAOSTAT), no calibration is needed. Figure of the Inland Water Bodies (418 “000” ha) has been adopted from the FAO STATISTICS for all the three years.

1.3.2 Estimation and forecasting

Original national figures for 1990 and 2000 are not available, therefore estimation and forecasting has been done as following.

An national level expert consultation was organized by government of Nepal to guide and provide information to FRA 2005. National experts from different institutions including Ministry of Forests and Soil Conservation participated in the discussions. The DFRS worked on eight alternatives models. The last alternative (model 8) reflected very close to the ground reality. This model was discussed with the Ministry of Forests and Soil Conservation, which gave its consent. This model was also agreed by the experts consultation meeting keeping in view the last paragraph, page 9 of "Guidelines for country reporting to FRA 2005" which states that it is important to stress that estimation and forecasting is not only a question of making mathematical calculations. It is equally important to assess whether the estimated/forecasted figures reflect reality. Many times there may be particular reasons why data from different years vary, and such variations do not necessarily imply that there is a

trend that can be used for estimation and forecasting." Following figures are outcome of the expert consultation for reporting to FRA 2005.

A. Forests

For 1990

The method of linear interpolation has been used to estimate extent of forest in Nepal in 1990 using 1985 figures from the MPFS (1988) and the DFRS (1999).

For 2000

The FRA 2000 figure is considered to reflect reality on the ground. The FRA 2000 figure were developed through linear extra-polation method using figures from LRMP (1978) along with DFRS (1999) and adding 133,000 ha of plantation area (Validation Sheet for FRA 2000).

For 2005

The figure for 2005 has been linearly forecasted based on FRA 2000 report (which is based on LRMP (1978) and DFRS (1999)) and NFI 1994 i.e. same trend as in FRA 2000 and keeping in mind following facts:

a. *Trees outside the forest area haven't been included under the category of forest.*
b. *Forest patches less than 6.25 ha haven't been regarded as forest while interpreting the aerial photographs in carrying out National Forest Inventory, 1994.*
c. *The shrub area in 2005 may be more close to 1897 (000 ha) estimate than the following computed figure of 2235 (000 ha).*

Variables	Extent in "000"ha					
	1978	**1985**	**1994**	**1990**	**2000**	**2005**
Extent of Forests in 1990		5504	4268	**4817**		
Extent of Forests in 2000	5605		4268		3767	3349
Add Plantations and forest patches (6.25 but > 0.5) not seen in Remote Sensing					133	
					3900	
Extent of Forest in 2005	5605		4268		3767	3349
Add Plantations and forest patches (6.25 but > 0.5) not seen in Remote Sensing						287
						3636
Extent of Shrubs in 1990		706	1560	**1180**		
Extent of Shrubs in 2000	692		1560		1886	2157
Less (Plantations and forest patches) and add shrub patches (<6.25 but > 0.5 ha) not in Remote Sensing					-133	78
					1753	**2235**
Total (Forest and Shrub)				**5997**	**5653**	**5871**

1.4 Reclassification into FRA 2005 classes

Table: Reclassification (percentage allocation into FRA 2005 Classes (excluding inland water)

National Land-Use	Percentage of a National Class belonging to a FRA Class			
	Forest	**Other Wooded land**	**Other land with Tree Cover**	**Other land**
Forest	100	-	-	-
Shrub	-	100	-	-
Others	-	-	-	100

1.5 Data for National reporting table T1

FRA 2005 Categories	Area (1000 hectares)		
	1990	**2000**	**2005**
Forest	4817	3900	3636
Other wooded land	1180	1753	1897
Other land	8303	8647	8767
...of which with tree cover [1)]			
Inland water bodies	418	418	418
TOTAL	**14718**	**14718**	**14718**

1.6 Comments to National reporting table T1

1. The figures are based on national expert consultation taking into account ground reality and information from past surveys and inventories.

2. Figure of 1897 (000 ha) for Shrubs in 2005 is more realistic then computed figure of 2235 (000 ha).

3. Inventory of the Trees Outside Forest under the category of 'Other Lands with Trees' of FRA 2005 has not yet been carried out in Nepal. Most of the trees grown on land categories other than the Forest are found in scattered and linear form. Therefore, tree resources found in other land categories couldn't be included as per the technical definition of the forest assuming at least 10% crown cover.

4. The figure of the Inland Water Bodies has been adopted from the FAO STATISTICS for all the three years.

2 Table T2 – Ownership of Forest and Other wooded land

2.1 FRA 2005 Categories and definitions

Category	Definition
Private ownership	Land owned by individuals, families, private co-operatives, corporations, industries, religious and educational institutions, pension or investment funds, and other private institutions.
Public ownership	Land owned by the State (national, state and regional governments) or government-owned institutions or corporations or other public bodies including cities, municipalities, villages and communes.
Other ownership	Land that is not classified either as "Public ownership" or as "Private ownership".

2.2 National data

2.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)
HMGN, 1995. Forest Act 1993 and Forest Regulation 1995. Ministry of Forest and Soil Conservation, Kathmandu, Nepal	H	Official and legal definitions	1993 1995
HMGN and MFSC. 2002. Nepal Biodiversity Strategy. Ministry of Forests and Soil Conservation.	H	Area of ownership	2000

2.2.2 Classification and definitions

Nepal's forest is legally categorized into National forests and Private forests. The National Forest includes Government-managed Forest, Protected Forest, Community Forest, Leasehold Forest and Religious Forest. The ownership and control of the national forest lies with the government and that of the private forest lies with the owner of the forest. In case of the community forest and leasehold forest, only the usufruct right has been given to the users.

National class	Definition
National Forest	All forests excluding private forest within the kingdom of Nepal, whether marked and unmarked with forest boundaries and the terms shall also 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 forest.
Government managed forest	A national forest to be managed by His Majesty's Government
Protected Forest	A national forest declared by His Majesty's Government as the protected forest considering it to be of special environmental, scientific or cultural importance.
Community Forest	A national forest handed over to an user group for its development, conservation and utilization for the collective interest.
Leasehold Forest	A national forest handed over to any institution established on the prevailing laws, industry based on forest products or community for the purposes of conservation and development of forest.
Religious Forest	A national forest handed over to any religious body, group or community for its development, conservation and utilization.
Private Forest	A forest planted, nurtured or conserved in any private land own by an individual pursuant to prevailing law.

2.2.3 Original data

The total area of registered "private forests" as on Jan 2000 is 2090.82 hectares (HMGN and MFSC, 2002). Information on private forests "before this date" is not available. The remaining area is all national forest and owned by the government of Nepal.

2.3 Analysis and processing of national data

2.3.1 Calibration

Since the national area match with FAO statistical figures (FAOSTAT), no calibration is needed.

2.3.2 Estimation and forecasting

The area of "private forests" in 1990 is assumed "0". The HMGN/NFSC, 2002 in Table 3.9 at page 52 indicates that about 2090.82 ha area is under private ownership in 2000 but it is not clear whether it has crown cover of more than 10 percent to quality as "forest" under FRA.

Forest	**Area in 000 ha**			
	Forest land		**Other Wooded land**	
	1990	**2000**	**1990**	**2000**
National Forest				
Private forests	0	2	0	0
Total				

2.4 Reclassification into FRA 2005 classes

Table: Reclassification (percentage allocation into FRA 2005 Classes

Categories	**Percentage of a National Class belonging to a FRA Class**		
	Public Ownership	Private Ownership	Other Ownership
National Forest	100	-	-
Private Forest		100	

2.5 Data for National reporting table T5

FRA 2005 Categories	**Area (1000 hectares)**			
	Forest		**Other wooded land**	
	1990	**2000**	**1990**	**2000**
Private ownership	n.a.	2	n.a.	n.a.
Public ownership	4817	3898	1180	1753
Other ownership			n.a.	n.a.
TOTAL	4817	3900	1180	1753

2.6 Comments to National reporting table T5

1. HMGN/ADB/FINNIDA, 1988 and DFRS, 1999 reports have not categorized the forest on the basis of ownership status.
2. HMGN/MFSC, 2002 in Table 3.9 at page 52 indicates that about 2090.82 ha area is under private ownership in 2000 but it is not clear whether it has crown cover of more than 10 percent to quality as "forest" under FRA 2005.

3 Table T3 – Designated function of Forest and Other wooded land

3.1 FRA 2005 Categories and definitions

Types of designation

Category	Definition
Primary function	A designated function is considered to be primary when it is significantly more important than other functions. This includes areas that are legally or voluntarily set aside for specific purposes.
Total area with function	Total area where a specific function has been designated, regardless whether it is primary or not.

Designation categories

Category / Designated function	Definition
Production	Forest / Other wooded land designated for production and extraction of forest goods, including both wood and non-wood forest products.
Protection of soil and water	Forest / Other wooded land designated for protection of soil and water.
Conservation of biodiversity	Forest / Other wooded land designated for conservation biological diversity.
Social services	Forest / Other wooded land designated for the provision of social services.
Multiple purpose	Forest / Other wooded land designated to any combination of: production of goods, protection of soil and water, conservation of biodiversity and provision of social services and where none of these alone can be considered as being significantly more important than the others.
No or unknown function	Forest / Other wooded land for which a specific function has not been designated or where designated function is unknown.

3.2 National data

3.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year
HMGN, 1995. Forest Act 1993 and Forest Regulation 1995. Ministry of Forest and Soil Conservation, Kathmandu, Nepal	H	Legal Definitions	1993 1995
HMGN/MFSC, 2002. Nepal Biodiversity Strategy. Ministry of Forests and Soil Conservation, Kathmandu, Nepal.	H	Community, Lease hold, Production, PAs, Protection For.	1988 to 2002
HMGN, 1998. The Ninth Plan (1997-2002). His Majesty's Government. National Planning Commission, Nepal	H	Area of Community Forest and PAs	1997

3.2.2 Classification and definitions

National class	Definition
Protected Forest	A national forest declared by His Majesty's Government as the protected forest considering it to be of special environmental, scientific or cultural importance.
Community Forest	A national forest handed over to an user group for its development, conservation and utilization for the collective interest.
Protected Areas	A geographically defined area that is regulated and managed to achieve a specific conservation objective.
Production Forest	Forests which is primarily used for the production of timber, fuelwood and non timber forest product
Leasehold Forest	Forests leased to any institution established under current law, industry or community, for the production of forest products, agro-forestry, tourism or farming of insects and wildlife in a manner conducive to the conservation and development of forests.

3.2.3 Original data
A. Protected Areas

Protected Areas (Year of Establishment)	1990	2002	Forest & Shrub
	000 ha	000 ha	000 ha (%)
National Park (NP)			
Royal Chitwan NP (1973)	93	93	80
Royal Bardia NP (1976/1988)	97	97	
Shivapuri NP (2002)		14	
Khaptad NP (1984)	23	23	
Makalu Barun NP (1991) [1]		150	86
Sagarmatha NP (1976)	115	115	2
Langtang NP (1976)	171	171	69
Shey Phoksundo NP (1984)	356	356	
Rara NP (1976)	**11**	11	
Sub Total NP	**864**	**1029**	**(44.80%)**
Wildlife Reserve (WR)			
Koshi Tappu WR (1976)	18	18	10
Parsa WR (1984)	50	50	49
Royal Suklaphanta WR (1976)	31	31	
Sub Total WR	**98**	**98**	**(87.54%)**
Hunting Reserve (HR)			
Dhorpatan HR (1987)	133	133	16
Sub Total HR	**133**	**133**	**(12.08%)**
Conservation Area (CA)			
Kanchenjunga CA (1997)		204	49
Manaslu CA (1998)		166	
Annapurna CA (1986, 1992)		763	153
Sub Total CA	**0**	**1133**	**(20.90%)**
Buffer Zone			
Royal Chitwan NP		75	
Royal Bardia NP		33	
Makalu Barun NP		83	
Langtang NP		42	
Shey Phoksundo NP		45	
Sagarmatha NP		28	
SubTotal Buffer Zone	**0**	**305**	
Total Area Protected	**1095**	**2697**	

Summary

Category	Area in 000 ha			Percentage Forest cover
	1990	2000	2002	
National Park (NP)	864	1015	1029	44.80
Wildlife Reserve (WR)	98	98	98	87.54
Hunting Reserve (HR)	133	133	133	12.08
Conservation Area (CA)	0	1133	1133	20.90
Buffer Zone	0	305	305	n.a.
Total Protected Area	**1095**	**2684**	**2697**	

B. Forest Areas

National Category	Year	Forest Area in 000 ha
Community Forest	1986	48.5
	1994	112.626
	1997	352.326
	2002	854.389
Leasehold forest	1998	7.011
Protected Areas	2001/2002	2697
Production Forest	1986	31
	1990	136
	2002	298.7
Protection Forest	2002	711.364

(1986 and 1990 estimated figures of production forest and 1986 figures for community forestry come from MPFS, 1988)

3.3 Analysis and processing of national data

3.3.1 Calibration

This step is not needed.

3.3.2 Estimation and forecasting

A. Protected Areas

In the year 1990, the PAs covered 1095 (000 ha) since a Park with an area of 150 (000 ha), three conservation areas spanning 1132 (000 ha) and the buffer areas covering 305 (000 ha) around the six national parks were added to PAs after 1990. Assuming that that the PA has the same relative percent of "forest" and "shrub" cover as in Table T1 for the year 1990 leads to the figure of 391(000) ha. of "forests" and 98 (000) ha. rest under Shrub land PA in 1990.

In the year 2000, the PA covered 2683 (000 ha) since only one National Park (Shivapuri) covering an area of 14.4 (000 ha) was added to the PA network between 2000 and 2002. Assuming that that the PA has the same relative percent forest and shrub as in Table T1 for the year 2000 leads to the figure of 811 (000 ha) of "forests" and 364 (000) ha. of "Shrub".

The area of PAs in 2005 has been assumed to be same as in 2002. The information on forest cover is available for only 1695 (000 ha). The percent of "forest and shrub cover" derived from this data has been applied to each category (NR, WR, HR and CA) of PA. Further, assuming that the PAs have the same relative percent "forest" and "shrub" as in Table T1 for the year 2005 leads to the figure of 733 (000 ha) of "forests" and 449(000) ha of "Shrub".

It is assumed that all the buffer zone were established after 1990 and with 0.737 million people living inside them, these areas do not meet definition of "forests".

National Category	**Area in 000 ha**		
	1990	**2000**	**2005**
Forest in NP, WR, HR and CA	391	811	776
Shrub (OWL) in NP,WR, HR and CA	98	364	405
Buffer	n.a.	305	305
Sub total	**489**	**1480**	**1486**
Other Land in Pas	606	1203	1210
Total	**1095**	**2683**	**2696**

B. Area other than Protected Areas

It has been assumed that forest area figures presented in section 3.2.2.B represent "forest and Shrub" as defined by FRA 2005. Further, it has been assumed that relative percent of "forests" and "Shrub" (OWL) cover in each of the categories is same as in over all percentage of "forests" as in Table 1.

a. Production Forests

The area of forest under "production forest" for 2002 has been assumed for 2000 and 2005.

b. Protection Forests

The area of "protection forests" in 2002 has been assumed for 1990, 2000 and 2005.

c. Community Forests

The areas has been linearly interpolated for 1990 and 2000 and the figure of 2 002 has been assumed for 2005

d. Lease Hold forests

The area under lease hold forests in 1998 has been assumed for 1990, 2000 and 2005.

National Category	Forest Area in 000 ha			OWL Area in 000 ha		
	1990	2000	2005	1990	2000	2005
Community Forest	65	451	529	16	203	325
Leasehold forest	6	5	4	1	2	3
Production Forest	109	206	185	27	93	114
Protection Forest	571	491	440	140	220	271

3.4 Reclassification into FRA 2005 classes

The management objectives of various forest categories are as below (HMGN/MFSC, 2002).

Forest Type	Forest Category	Management Objectives
National Forest	Forests managed by HMGN	Production of forest products
	Community Forests	Production of forest products and multiple purpose use
	Leasehold Forests	Rehabilitation of degraded forests, production of forest products, tourism, wildlife farming
	Religious Forests	Protection of religious site
	Protected Forests	Protection of wildlife, conservation of water, biodiversity and environment

A Reclassification (percentage allocation) into Primary Function FRA 2005 Classes

National Classes	Percentage of a National Class into FRA 2005 Class (Primary Function)					
	Production	Protective	Conservation	Social Services	Multiple Objective Forest	No Function
Production	100					
Community					100	
Lease Hold					100	
Protected Areas			100			
Protection		100				
Rest						100

B. Reclassification (percentage allocation) into Total Area with function FRA 2005 Classes

National Classes	Percentage of a National Class into FRA 2005 Class (Total Area Fuction)				
	Production Forest	Protection	Conservation	Social Services	Multiple Object.
Production	100				
Community	100	100			
Lease Hold	100	100			
Protected Areas		100	100	100	
Protection		100	100		

3.5 Data for National reporting table T3

FRA 2005 Categories / Designated function	Area (1000 hectares)					
	Primary function			Total area with function		
	1990	2000	2005	1990	2000	2005
Forest						
Production	109	206	185	180	662	718
Protection of soil and water	571	491	440	1033	1758	1749
Conservation of biodiversity	391	811	776	962	1302	1216
Social services				391	811	776
Multiple purpose	71	456	533	not appl.	not appl.	not appl.
No or unknown function	3675	1936	1702	not appl.	not appl.	not appl.
Total – Forest	4817	3900	3636	**not appl.**	**not appl.**	**not appl.**
Other wooded land						
Production	27	93	114	44	298	442
Protection of soil and water	140	220	271	255	789	1004
Conservation of biodiversity	98	364	405	238	584	676
Social services				98	364	405
Multiple purpose	17	205	328	not appl.	not appl.	not appl.
No or unknown function	898	871	779	not appl.	not appl.	not appl.
Total – Other wooded land	1180	1753	1897	**not appl.**	**not appl.**	**not appl.**

3.6 Comments to National reporting table T3

1) The trend in forest and shrub lands is based on ratio of the forest and the shrub in Table 1 and hence may not capture actual condition on the ground.

2) Community forest areas also include the area of forest, shrub land and pasture land.

4 Table T4 – Characteristics of Forest and Other wooded land

The characteristic of forest and other wooded land is very important for the development of appropriate forest management activities to derive goods and services from the forest in a sustainable manner. Despite the importance of such information, it is very difficult to generate the original data since there is no standard classification and definition based on characteristics of the forest. The national forest inventory has not addressed the parameters presented in this heading.

4.1 FRA 2005 Categories and definitions

Category	Definition
Primary	Forest / Other wooded land of native species, where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed.
Modified natural	Forest / Other wooded land of naturally regenerated native species where there are clearly visible indications of human activities.
Semi-natural	Forest / Other wooded land of native species, established through planting, seeding or assisted natural regeneration.
Productive plantation	Forest / Other wooded land of introduced species, and in some cases native species, established through planting or seeding mainly for production of wood or non wood goods.
Protective plantation	Forest / Other wooded land of native or introduced species, established through planting or seeding mainly for provision of services.

4.2 National data

4.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Years
HMGN/MFSC. 2002. Nepal Biodiversity Strategy. Ministry of Forests and Soil Conservation, Kathmandu, Nepal.	H	Characteristics	2002
DFRS, 1999. Forest Resources of Nepal (1987-1998). Department of Forest Research and Survey, Ministry of Forest And Soil Conservation, Kathmandu, Nepal	H	Characteristics	1994
HMGN/ADB/FINNIDA, 1988. Master Plan for the Forestry Sector in Nepal. Ministry of Forest and Soil Conservation, Kathmandu, Nepal.	H	Plantations	1985-86
DOF. 1999. Country Report to Forest Resources Assessment 2000.	H	Plantations	1999

4.2.1 Classification and definitions

There are no national definitions and record in FRA classes like primary, modified natural, semi-natural, productive plantation and protective plantation. Following assumptions have been made and related definitions and data are being provided for the purposes of this table.

A. Primary Forest: The forest area in National Parks, Wildlife Reserves and Hunting Reserves have been placed under this category of FRA 2005.

B. Modified Natural Forest: All the forest areas in conservation areas (under the category of protected area system) have been placed this category of FRA 2005 Class.

C. Semi-Natural Forest: The rest of the forest areas of the country (excluding plantations) have been placed under this category of FRA 2005 Class.

D. Productive Plantations: All plantation for industrial round wood, fuelwood and poles have been placed under this category of FRA 2005.

E. Protective Plantations: All plantations raised for watershed development have been placed under this category of FRA 2005.

Classification	Definition
National Park	Area set aside for the conservation and management of the natural environment, including the ecological, biological and geomorphology associations of aesthetic importance.
Wildlife Reserve	An area established for the conservation and management of plants and wildlife and their habitat.
Hunting Reserve	An area set aside for the conservation and management of wildlife to provide opportunities for legal recreational hunting
Conservation Area	An area managed according to an integrated plan for the conservation of the natural environment and sustainable use of the natural resources contained within it.
Buffer Zone	A designated area surrounding a national parks or a reserve within which the use of forest products by local people is regulated to ensure sustainability.

4.2.3 Original data

A. Protected Areas of the country: From Table 3

National Category	Area in 000 ha		
	1990	2000	2005
Forest in NP, WR and HR	391	384	349
Forest in CA	0	427	384
Total	**391**	**811**	**733**

B. Forest Plantation

Purpose of plantation	Area in 000 ha	
	1986	1999
Industrial, Fuelwood and Pole Plantations		41.8
Watershed Development Plantation		9.5
Total	**47.3**	**51.3**

4.3 Analysis and processing of national data

4.3.1 Calibration

Not considered necessary

4.3.2 Estimation and forecasting

A. Protected Area

Not necessary.

B. Plantation

The area under plantation in 1990, 2000 and 2005 has been linearly interpolated and extrapolated. It has been assumed that relative percentage of protective and productive (industrial wood, fuelwood and poles) in 1990, 2000 and 2005 is same as in 1999.

National Category	Area in 000 ha		
	1990	2000	2005
Industrial, Fuelwood and Pole Plantations	40	42	43
Watershed Development Plantation	9	10	10
Total	**49**	**52**	**53**

C. Other Wooded land

All area is being assumed to be semi-natural.

4.4 Reclassification into FRA 2005 classes

Table: Reclassification (percentage allocation) into FRA 2005 Classes

National Class	Percentage of a National Class into a FRA Class				
	Primary	Modified Natural	Semi-Natural	Productive Plantation	Protective Plantation
Forest in NP, WR and HR	100				
Plantations for Industrial wood, fuelwood and poles				100	
Watershed Development plantations					100
Forest in CA		100			
Rest of the Forest areas			100		

4.5 Data for National reporting table T4

FRA 2005 Categories	Area (1000 hectares)					
	Forest			Other wooded land		
	1990	2000	2005	1990	2000	2005
Primary	391	384	370	n.a.	n.a.	n.a.
Modified natural	0	427	407	n.a.	n.a.	n.a.
Semi-natural	4377	3037	2806	1180	1753	1897
Productive plantation	40	42	43	n.a.	n.a.	n.a.
Protective plantation	9	10	10	n.a.	n.a.	n.a.
TOTAL	**4817**	**3900**	**3636**	**1180**	**1753**	**1897**

4.6 Comments to National reporting table T4

5 Table T5 – Growing stock

This information on 'Growing Stock' is essential to understand the dynamics of forest stand, their productive capacity and to manage their use within limits of sustainability defined by their dynamics of growth.

5.1 FRA 2005 Categories and definitions

Category	Definition
Growing stock	Volume over bark of all living trees more than X cm in diameter at breast height (or above buttress if these are higher). Includes the stem from ground level or stump height up to a top diameter of Y cm, and may also include branches to a minimum diameter of W cm.
Commercial growing stock	The part of the growing stock of species that are considered as commercial or potentially commercial under current market conditions, and with a diameter at breast height of Z cm or more.

5.2 National data

Department of Forest Research and Survey (DFRS) is the only government designated forest research and survey organization in Nepal that works in close collaboration with various national stakeholders and international agencies. The Forest Survey Division of the Department generates valuable statistics and information necessary to plan overall forestry development at national, regional and district level. Regarding the growing stock, the first inventory on a national level took place in the 1960s. Inventory results were presented for the Terai and adjoining regions in 1967 and for the Hills in 1973. The Master plan for forestry sector updated the figures for 1986 in 1988. The latest national forest inventory was completed in 1994 and report was published in 1999.

5.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Years
DFRS, 1999. Forest Resources of Nepal (1987-1998). Department of Forest Research and Survey, Ministry of Forest And Soil Conservation, Kathmandu, Nepal	H	Growing Stock	1994
HMGN/ADB/FINNIDA, 1988. Master Plan for the Forestry Sector in Nepal. Ministry of Forest and Soil Conservation, Kathmandu, Nepal.	H	Growing Stock	1985 1986
WECS, 1988. District, Regional and national Forest Cover Class Summaries of the Area, Fuelwood Yield and Wood Volume for the Kingdom of Nepal. Water and Energy Commission Secretariat, His Majesty's Government of Nepal.	H	Growing Stock	1985 1986

5.2.2 Classification and definitions

National class	Definition
Growing Stock	The gross volume to a 10 cm top diameter outside bark (ob) of standing trees of greater than 10 cm diameter at breast height (dbh) Explanation: the volume over bark of all living trees more than 10 cm diameter at breast height (or above buttressed if these are higher). Includes the stem from ground level or stump height up to a top diameter of 10 cm excluding branches, twigs, stumps and roots.

Commercial growing stock	The part of the growing stock of species that are considered as commercial or potentially commercial under current market conditions, and with a diameter at breast height of 10 cm or more. Includes all potentially commercial (merchantable) species for domestic markets Explanation: This definition is based on the definition given by FAO as there is no separate definition for commercial growing stock available in Nepal.
Non-Reachable Forest	A forest area is non reachable if it is located on a slope more than 100% (45 degrees) or if it is surrounded by steep slope, landslide or other physical obstacle. Also, forests inside protected areas (National Parks, Wildlife Reserves, and Conservation Areas) are taken as Non Reachable Forest.
Reachable Forest	A forest located outside parks and protected areas on a slope with an inclination of less than 100 % (45 degrees) or if it is not surrounded by steep slope, landslide or other physical obstacles.

5.2.1 Original data

	Unit	1960	1985/86	1994
Forest	**Forest Area under consideration/ Inventory in million ha**	2.5	5.416	2.179
	Growing stock of trees up to 10 cm diameter at breast height in million cum of	212	522	387.5
	Growing stock /ha	85	96.36	177.8

Source: HMGN/ADB/FINNIDA, 1988; DFRS, 1999

5.3 Analysis and processing of national data

5.3.1 Calibration

Calibration is not necessary to calculate the growing stock.

5.3.2 Estimation and forecasting

The growing stock for 1990, 2000 and 2005 has been derived from the forest area presented in T1 table. The national figure of average stem volume (ob) of 96.36 m^3/ha for 1985/86 has been used to estimate the total growing stock in forests for the year 1990 (HMGN/ADB/FINNIDA, 1988). Similarly the figure of 177.8 m^3/ha for 1994 has been used estimating growing stock in forests for 2000 and 2005 (DFRS, 1999). Regarding the growing stock in OWL (shrub land) the average stem volume of shrub (OWL) 30 cu.m/ha has been taken from the WECS, 1988.

Table: Total Growing Stock of Forest and Shrub land

Category	Growing stock in million cu.m ob		
	1990	2000	2005
Forest	464	694	647
OWL	35	53	67
Total	499	747	704

(Source: HMGN/ADB/FINNIDA, 1988; WECS, 1988, Department of Forest Research and Survey, 1999)

5.4 Reclassification into FRA 2005 classes

Table: Reclassification (Percentage allocation) into FRA 2005 Classes

National Classification	Percentage of a National Class belonging to a FRA Class	
	Growing Stock	**Commercial Growing Stock**
Growing Stock	100	40% of growing stock in Forests 20% of growing stock in OWL

5.5 Data for National reporting table T5

FRA 2005 Categories	Volume (million cubic meters over bark)					
	Forest			Other wooded land		
	1990	**2000**	**2005**	**1990**	**2000**	**2005**
Growing stock	464	694	647	35	53	67
Commercial growing stock	186	277	259	7	11	13

Specification of country threshold values	Unit	Value
1. Minimum diameter at breast height of trees included in Growing stock (X)	cm	10
2. Minimum diameter at the top end of stem (Y) for calculation of Growing stock	cm	10
3. Minimum diameter of branches included in Growing stock (W)	cm	NA
4. Minimum diameter at breast height of trees in Commercial growing stock (Z)	cm	10
5. Volume refers to "Above ground" (AG) or "Above stump" (AS)	AG / AS	AG
6. Have any of the above thresholds (points 1 to 4) changed since 1990	Yes/No	No
7. If yes, then attach a separate note giving details of the change	Attachment	-

5.6 Comments to National reporting table T5

1. National Forest Inventory Report 1999 has not mentioned the average stem volume (ob) per hectare of the shrub land and therefore this figure is taken from WECS, 1988.

2. Commercial growing stock data is not available in Nepal. It has been assumed that the commercial growing stock in forest is 40% of the total growing stock in forests and the commercial growing stock in OWL is 20% of the total growing stock in OWL.

6 Table T6 – Biomass stock

6.1 FRA 2005 Categories and definitions

Category	Definition
Above-ground biomass	All living biomass above the soil including stem, stump, branches, bark, seeds, and foliage.
Below-ground biomass	All living biomass of live roots. Fine roots of less than 2mm diameter are excluded because these often cannot be distinguished empirically from soil organic matter or litter.
Dead wood biomass	All non-living woody biomass not contained in the litter, either standing, lying on the ground, or in the soil. Dead wood includes wood lying on the surface, dead roots, and stumps larger than or equal to 10 cm in diameter or any other diameter used by the country.

6.2 National data

National data for the biomass estimation and forecasting are based on the following sources of information.

6.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Years
DFRS, 1999. Forest Resources of Nepal (1987-1998). Department of Forest Research and Survey, Ministry of Forest And Soil Conservation, Kathmandu, Nepal	H	Biomass	1994
HMGN/ADB/FINNIDA, 1988. Master Plan for the Forestry Sector in Nepal. Ministry of Forest and Soil Conservation, Kathmandu, Nepal.	H	Biomass	1985-86
WECS, 1988. District, Regional and national Forest Cover Class Summaries of the Area, Fuelwood Yield and Wood Volume for the Kingdom of Nepal. Water and Energy Commission Secretariat, His Majesty's Government of Nepal.	H	Biomass	1985-86
Harmon, M. E; O.N Krankina, M. Yatskov and E. Matthew. 2001. Predicting Broad- Scale Carbon Stock of Woody Detritus from Plot-Level Data. Pp 533-552 In: Lal, R., J.Kimble, B.A. Steward, Assessement Method for Soil Carbon, CRC press, New York.	H	Dead wood biomass	2001

6.2.2 Classification and definitions

National class	Definition
Biomass	Air dry weight of stems, branches and leaves (kg)

6.2.3 Original data

Category	Biomass in million tons (air dry)	
	1985/86	1994
Forests	628 Over 5.417 million ha	429 over 2.179 million ha

Source: HMGN/ADB/FINNIDA, 1988; DFRS, 1999

6.3 Analysis and processing of national data

6.3.1 Calibration

Calibration is not necessary to estimate the biomass.

6.3.2 Estimation and forecasting

A. Above ground biomass

To estimate biomass, the growing stock to biomass conversion factors (see below) of 1986 has been used for estimating biomass for 1990 and that of 1994 for 2000 and 2005 for forest areas. The same factors have been used estimating biomass in OWL for 1990, 2000 and 2005.

Biomass in Forests	**1986**	**1994**
Area (million ha) covered by Biomass figures	5.417	2.179
Biomass Stock million tonnes	628	429
Growing Stock million m3 (> 10 cm dbh)	522	388
Growing Stock to Biomass factor	1.20	1.11
Biomass per ha	115.93	196.88

This leads to the following figures for above ground biomass

	1990	**2000**	**2005**
Growing stock to Biomass Factor	1.20	1.11	1.11
Growing Stock in forests in million m^3	464	694	647
Above Ground Biomass in Forests in million tonnes	557	770	718
Growing Stock in OWL in million m^3	35	53	57
Above Ground Biomass in OWL in million tonnes	42	58	63
Total	**599**	**828**	**781**

B. Below Ground Biomass

The default root shoot ratios of 0.24 for Broad leaved and 0.46 for conifers has been adopted from the GPG 2003. The arithmetic average (0.35) of these two figures has been applied to 1990, 2000 and 2005 data. This leads to the following figures of below ground biomass.

Below Ground Biomass	**1990**	**2000**	**2005**
Below Ground Biomass in Forest in million tonnes	195	269	251
Below Ground Biomass in OWL in million tonnes	15	20	22

C. Dead Wood Biomass

The dead wood biomass has been estimated by using default factors given in GOG 2003. An average dead-live ratio of 0.15 has been derived by taking the average value of three major biomes, namely the tropical forest (0.11), evergreen forest (0.20) and deciduous forest (0.14).

Biomass in Forests in million tonnes	**1990**	**2000**	**2005**
Above ground biomass in Forests	557	770	718
Below ground Biomass in Forests	195	269	251
Total Live Biomass in Forests	752	1039	969
Deadwood biomass 0.15% of the total live biomass	113	156	145

Biomass in OWL in million tonnes	**1990**	**2000**	**2005**
Above ground biomass in OWL	42	58	63
Below ground Biomass in OWL	15	20	22
Total Live Biomass in OWL	57	79	85
Deadwood biomass 0.15% of the total live biomass	9	12	13

6.4 Reclassification into FRA 2005 classes

Category	**Percentage allocation of a national class to a FRA class**		
	Above ground tree biomass	**Below ground tree biomass**	**Dead wood biomass**
Above ground biomass	100		
Below ground biomass		100	
Dead wood biomass			100

6.5 Data for National reporting table T6

FRA 2005 Categories	**Biomass (million metric tonnes air-dry weight)**					
	Forest			**Other wooded land**		
	1990	**2000**	**2005**	**1990**	**2000**	**2005**
Above-ground biomass	557	770	718	42	58	63
Below-ground biomass	195	269	251	15	20	22
Dead wood biomass	113	156	145	9	12	13
TOTAL	**865**	**1195**	**1114**	**66**	**90**	**98**

Thresholds used by the country are the following:

Appendix National Reporting Table 6

Items	**Units**	**Information**	
		1985/86	**1994**
1. Area over which biomass has been measured	000 ha	5518	4268
2. Average height of the stump	Cm	15	15
3. Minimum diameter (X) for ' dead wood biomass' measurements		NA	NA
4. Stump biomass is in above/ below ground tree biomass	Above/below	Below	Below
5. Whether biomass includes or excludes bark	Includes/excludes	Includes	Includes
6. Have above threshold changed since 1990	Yes/No	No	No
7. If yes, then attach a separate note giving details of the changed	Yes/No	NA	NA

6.6 Comments to National reporting table T6

The National Forest Inventory 1990s and MPFS 1988 provide biomass estimate including leaf, branch and stem components.

7 Table T7 – Carbon stock

The information on carbon stock is important to know the contribution of forest and shrub land to carbon cycle. It is also important in relation to mitigation of global climate change.

7.1 FRA 2005 Categories and definitions

Category	Definition
Carbon in above-ground biomass	Carbon in all living biomass above the soil, including stem, stump, branches, bark, seeds, and foliage.
Carbon in below-ground biomass	Carbon in all living biomass of live roots. Fine roots of less than 2 mm diameter are excluded, because these often cannot be distinguished empirically from soil organic matter or litter.
Carbon in dead wood biomass	Carbon in all non-living woody biomass not contained in the litter, either standing, lying on the ground, or in the soil. Dead wood includes wood lying on the surface, dead roots, and stumps larger than or equal to 10 cm in diameter or any other diameter used by the country.
Carbon in litter	Carbon in all non-living biomass with a diameter less than a minimum diameter chose by the country for lying dead (for example 10 cm), in various states of decomposition above the mineral or organic soil. This includes the litter, fumic, and humic layers.
Soil carbon	Organic carbon in mineral and organic soils (including peat) to a specified depth chosen by the country and applied consistently through the time series.

7.2 National data

No national data sources provide information on the carbon content.

7.2.1 Data sources

The biomass information is used from Table 6 and default factor is adopted from GPG 2003.

7.2.2 Classification and definitions

No standard national classification and definitions.

7.2.3 Original data

No original data available for carbon content.

7.3 Analysis and processing of national data

7.3.1 Calibration

No calibration is needed.

7.3.2 Estimation and forecasting

A. Carbon in above and below ground biomass and in deadwood

The GPG default factor of 0.5 has been used to convert biomass stock into carbon stock.

Carbon Stock	Carbon Stock (million metric tonnes)					
	Forest			Other wooded land		
	1990	2000	2005	1990	2000	2005
Carbon in Above ground biomass	278	385	359	21	29	32
Carbon in Below ground biomass	97	135	126	7	10	11
Total	375	520	484	28	39	43
Carbon in Dead wood biomass	56	78	73	4	6	6

B. Carbon in litter Stock

The average (3.45 tonnes/ha) of the two GPG (2003) default factors (2.8 tonnes/ ha for broad leaved forests and 4.1 tonnes/ ha for coniferous forest have been used for this estimate.

Carbon Stock	Carbon Stock (million metric tonnes)					
	Forest			Other wooded land		
	1990	2000	2005	1990	2000	2005
Carbon in litter (tonnes/ha)	3.45	3.45	3.45	3.45	3.45	3.45
Carbon in litter million tonnes	17	13	13	4	6	7

C. Carbon in Soil

Soil Carbon figure has been estimated on the basis of country report of Nepal submitted to UNFCC held on July 2004. The assumptions are:

Forest Region	Soil Carbon tonnes /ha	Area million ha	Soil Carbon	Weighted Per hectare Soil Carbon
Teral Forest	102	0.487	49.674	
Warm temperate Forest	68	3.386	230.248	
Cold Temperate Forest	124	1.954	242.296	
		5.827	522.218	89.620

Carbon Stocks	Carbon Stock (million metric tonnes)					
	Forest			Other wooded land		
	1990	2000	2005	1990	2000	2005
Soil Carbon (tonnes/ha)	89.62	89.62	89.62	89.62	89.62	89.62
Soil Carbon million tonnes	432	350	326	106	157	170

Percentage allocation of a national class to a FRA class

7.4 Reclassification into FRA 2005 classes

	Carbon in above ground biomass	Carbon in Below ground biomass	Carbon in deadwood	Carbon in litter	Soil Carbon
Carbon stock in above ground biomass	100	-			
Carbon stock in below ground biomass		100			
Carbon stock in dead wood			100		
Carbon Stock in litter				100	
Soil Carbon					100

7.5 Data for National reporting table T7

FRA 2005 Categories	Carbon (Million metric tonnes)					
	Forest			Other wooded land		
	1990	2000	2005	1990	2000	2005
Carbon in above-ground biomass	278	385	359	21	29	32
Carbon in below-ground biomass	97	135	126	7	10	11
Sub-total: Carbon in living biomass	**375**	**520**	**485**	**28**	**39**	**43**
Carbon in dead wood	56	78	73	4	6	6
Carbon in litter	17	13	13	4	6	7
Sub-total: Carbon in dead wood and litter	**73**	**91**	**86**	**8**	**12**	**13**
Soil carbon to a depth of 100 cm	**432**	**350**	**326**	**106**	**157**	**170**
TOTAL CARBON	**880**	**961**	**897**	**142**	**208**	**226**

7.6 Comments to National reporting table T7

8 Table T8 – Disturbances affecting health and vitality

Fire, insects, diseases and encroachment are some of the major factors affecting the health and vitality of the forest in Nepal. The information on such factors is crucial to minimize their effect on forest quality.

8.1 FRA 2005 Categories and definitions

Category	Definition
Disturbance by fire	Disturbance caused by wildfire, independently whether it broke out inside or outside the forest/OWL.
Disturbance by insects	Disturbance caused by insect pests that are detrimental to tree health.
Disturbance by diseases	Disturbance caused by diseases attributable to pathogens, such as a bacteria, fungi, phytoplasma or virus.
Other disturbance	Disturbance caused by other factors than fire, insects or diseases.

8.2 National data

8.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)
DoF, 2002. Hamro Ban. Department of Forests, Kathmandu, Nepal	H	Encroachment area	2002
Bajracharya, KM 2002. Forest Fire Situation in Nepal: A country Report submitted to IFFN/GFNC in January 2002. Pp 84-86. Website: www.fire.uni-freiburg.de/iffn/country/np.	H	Forest fire	2002
DFRS, 2000. Study on Die - Back of Sissoo (*Dalbergia sissoo*). Department of Forest Research and Survey in Collaboration with TISC and CARE Nepal. Kathmandu, Nepal	H	Disease, pest	2000

8.2.2 Classification and definitions

National class	Definition
Encroachment	An illegal process of cultivating the forest land and building of houses, huts and sheds for the purpose of settlement.

8.2.3 Original data

It has been reported that the forest area burnt annually in Nepal is around 4,00,000 hectare (Bajracharya, 2002). To date, there is no data available on insect/pest damages to forests in Nepal except few data available for Sissoo (*Dalbergia sissoo*). Of the total Sissoo population of 49,401 ha in 24 districts in Nepal, only 1,222 ha is the natural stand. The survey reveals that 6.4 and 9.2 percent of the total sissoo population are dead and dying respectively. Accordingly there about 78 ha of sissoo population are dead and 112 ha are dying (DFRS, 2000).

8.3 Analysis and processing of national data

8.3.1 Calibration

Not needed.

8.3.2 Estimation and forecasting

The estimated extent of disturbances by fire 2000 has been assumed for 1990.

8.4 Reclassification into FRA 2005 classes

Not needed.

8.5 Data for National reporting table T8

It is assumed that the 78 ha of Sissoo plantation, which are dead, were affected by the "dieback" phenomenon around 1990. Further that the 112 ha of Sissoo plantations, which are currently dying, were affected after 1990.

FRA-2005 Categories	Average annual area affected (1000 hectares)			
	Forests		Other wooded land	
	1990	2000	1990	2000
Disturbance by fire	400	400	n.a.	n.a.
Disturbance by insects	n.a.	n.a.	n.a.	n.a.
Disturbance by diseases	0.078	0.112	n.a.	n.a.

8.6 Comments to National reporting table T8

Encroachment i.e. illegal conversion area of the forest land into other land, use is a other major cause of disturbance to forests and other wooded lands in Nepal. From 1964 to 1991, its extent has gone up to 3,80,000 ha, which on average is about 14,074 ha per ha. during this period.

9 Table T9 – Diversity of tree species

The National Forest Inventory carried out in 1994 by the Department of Forest Research and Survey has mentioned the list of inventoried tree species by development regions.

9.1 FRA 2005 Categories and definitions

Category	Definition
Number of native tree species	The total number of native tree species that have been identified within the country.
Number of critically endangered tree species	The number of native tree species that are classified as "Critically endangered" in the IUCN red list.
Number of endangered tree species	The number of native tree species that are classified as "Endangered" in the IUCN red list.
Number of vulnerable tree species	The number of native tree species that are classified as "Vulnerable" in the IUCN red list.

9.2 National data

Nepal incorporates Palaearctic and Indo-Malayan bio-geographical regions and major floristic provinces of Asia, creating a unique and rich diversity of life. Nepal falls in the 25th and 11th position in terms of species richness at the global and continental level respectively (MOPE, 2000). A total of 118 forest ecosystem, with 75 vegetation types and 35 forest types have been identified in Nepal (NBS, 2002). About 2.6% of the flowering plants, 3.2% of the Pteridophytes and 6% of the Bryophytes of the world's flora have so far been recorded in Nepal (MOPE, 2000). Altogether, 60 species of non endemic plants are regarded as threatened. These include 12 endangered species, 11 vulnerable species, 22 rare species, two indeterminate species, five in sufficient known species and seven threatened species. Similarly, for total of 342 plant species have been reported as been endemic to Nepal.

9.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)
NBS, 2002. Nepal Biodiversity Strategy. Ministry of Forests and Soil Conservation, Kathmandu, Nepal.	H	Bio-Diversity	2002
Shrestha, T. B. and Joshi, R. M. 1996. Rare, endemic and endangered plants of Nepal. WWF Nepal Program, Nepal.	H	Threatened species	1996
MOPE, 2000. Nepal's State of the Environmnet. His Majesty's Government, Ministry of Population and Environment, Nepal.	H	Flora and Fauna	2000

9.2.2 Classification and definitions

There are no standard national classification and definitions.

9.2.3 Original data

List of Threatened Tree Species in Nepal

SN	Scientific Name	Local Name	IUCN/CAMP Threat Category
1	*Acacia catechu*	Khair	T
2	*Alstonia sholaris*	Chhatiwan	R
3	*Butea monosperma*	Palas	EN
4	*Crateva unilocularis*	Siplican	R
5	*Dalbergia latifolia*	Sati Sal	V
6	*Elaeocarpus sphaericus*	Rudrakshya	V
7	*Michelia champaca*	Champ	EN
8	*Oroxylum indicum*	Tatelo	V
9	*Pterocarpus marsupium*	Bijay Sal	CR
10	*Taxus wallichiana*	Lauth Salla	EN

Note: EN= endangered, R= rare, V= vulnerable, T= threatened, CR= critically endangered

ICUN Red list (2004) of threatened species only lists following 3 vulnerable tree species.

1	*Cycas pectinata*
2	*Dalbergia latifolia*
3	*Scaphophyllum speciosum*

9.3 Analysis and processing of national data

9.3.1 Calibration

Not needed.

9.3.2 Estimation and forecasting

Not needed

9.4 Reclassification into FRA 2005 classes

Not needed.

9.5 Data for National reporting table T9

FRA 2005 Categories	Number of species (year 2000)
Native tree species	225
Critically endangered tree species	0
Endangered tree species	0
Vulnerable tree species	3

(Number of native species is number of species inventoried native tree species)

9.6 Comments to National reporting table T9

1. It is assumed that the number of native tree species of 1994 will remain same in the year 2000.

10 Table T10 – Growing stock composition

The information on composition of growing stock is very important to understand the dynamics of forest composition and forest biodiversity.

10.1 FRA 2005 Categories and definitions

10.2 National data

10.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable	Years
DFRS, 1999. Forest Resources of Nepal (1987-1998). Department of Forest Research and Survey, Ministry of Forest And Soil Conservation, Kathmandu, Nepal	H	Growing Stock	1994

10.2.2 Original data

The National Forest Inventory of 1960 and 1994 has provided the information on relative percentage of growing stock (GS) by tree species. Based only on the share of growing stock of the tree species, the relative ranking (first being the highest share in growing stock) of ten most common tree species are as follows:

Table: Ranking of Major Tree Species by Growing Stock

SN	Scientific Name	Common Name	Local name	Percent Share in GS of 1960	Percent Share in GS of 1960
1.	*Shorea robusta*	Sal	Sal, Sakhuwa	31.0	28.2
2.	*Quercus spp*	Oak	*Khasru*	n.a.	9.3
3.	*Terminalia alata*	Indian laurel	Asna, Saj	8.2	7.6
4.	*Pinus roxburghii*	Chir pine	Khote salla	6.9	6.3
5.	*Abies spectabilis*	Silver fir	Talis patra	9.5	4.4
6.	*Rhododendron spp*	Rhododendron	*Lali gurans*	n.a.	4.3
7.	*Alnus nepalensis*	Alder	Uttis	n.a.	2.9
8.	*Schima wallichii*		*Chilaune*	n.a.	2.0
9.	*Tsuga dumosa*	Hemlock	Thingure sall	2.4	1.9
10.	*Adina cordifolia*		Karma, Haldu	n..a	1.8

Source: DFRS, 1999.

10.3 Analysis and processing of national data

10.3.1 Calibration

Not considered necessary.

10.3.2 Estimation and forecasting

It is assumed that the relative share of growing stock of the tree species will continue to remain same in years 1990 and 2000 as it was in 1994.

10.4 Reclassification into FRA 2005 classes

Not needed

10.5 Data for National reporting table T10

FRA 2005 Categories / Species name (Scientific name)	**Local Common name**	**Growing Stock in Forests (million cubic meters)**	
		1990	**2000**
Shorea robusta	Sal, Sakhuwa	130.8	195.6
Quercus spp	*Khasru*	43.2	64.5
Terminalia alata	Asna, Saj	35.3	52.7
Pinus roxburghii	Khote salla	29.2	43.7
Abies spectabilis	Talis patra	20.4	30.5
Rhododendron spp	*Lali gurans*	20.0	29.8
Alnus nepalensis	Uttis	13.5	20.1
Schima wallichii	*Chilaune*	9.3	13.9
Tsuga dumosa	Thingure sall	8.8	13.2
Adina cordifolia	Karma, Haldu	8.3	12.5
Remainder of species	Remainder of species	145.2	217.5
TOTAL	**TOTAL**	464	654

10.6 Comments to National reporting table T10

11 Table T11 – Wood removal

Information on removal of round wood and woodfuel only from the forest areas has been considered while compiling the national figure of wood removal.

11.1 FRA 2005 Categories and definitions

Category	Definition
Industrial wood removal	The wood removed (volume of roundwood over bark) for production of goods and services other than energy production (woodfuel).
Woodfuel removal	The wood removed for energy production purposes, regardless whether for industrial, commercial or domestic use.

11.2 National data

11.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)
HMGN, 1995. Forest Act 1993 and Forest Regulation 1995. Ministry of Forest and Soil Conservation, Nepal	H	Legal definitions	1993 1995
MoF, 1992. Economic Survey, Fiscal Year 1991/92. HMGN, Ministry of Finance, Kathmandu	H	wood removal	1992
DoF, 1994. Department of Forest: an Introduction. Department of Forests, Kathmandu, Nepal	H	wood removal	1994
DoF, 1999. Department of Forest: Annual Report (Fiscal year 1997/98). Department of Forests, Kathmandu, Nepal	H	wood removal	1999
DoF, 2002. Hamro Ban. Department of Forests, Nepal	H	wood removal	2002
DoF, 2003. Hamro Ban (Fiscal Year 2001/02). Department of Forests, Kathmandu, Nepal	H	wood removal	2003
DoF, 2004. Hamro Ban (Fiscal Year 2002/03). Department of Forests, Kathmandu, Nepal	H	wood removal	2004
HMGN/FINNIDA, 1998. Strategic Guidelines for Forest Utilization. Main Report. FRIS Project Paper 10. Forest Resource Information System Project, Nepal	H	wood removal	1998

11.2.2 Classification and definitions

National class	Definition
Forest Products	The following products which are contained or found in or brought from forests: 1. Timber, firewood, charcoal. catechu, rosin, wood-oil, bark, lac, pipla, pipli (*piper longum*), or 2. Trees, leaves, fruits, flowers, mahwa (*bassia longifolia*), chiraito (*swertia chiretta*), Kutki (*Picorhiza kurroa*) and all kinds of wild herbs, vegetation and different parts or organs thereof, or 3. Boulders, soil, stones, pebbles, sand, or 4. Birds, wildlife and trophies thereof.
Firewood	Wood other than of Acacia catechu of less than two feet in length and one feet and six inches in girth which can't be used as beams and poles or sawn timber
Chatta	Stack of fuelwood with the dimension 20 ft x 5 ft x 5 ft (around 6400 Kgs but depends on the density of fuelwoods)

11.2.3 Original data

Following conversion factors have been used to present the following information in round wood cubic meters:

a. 1 cubic meter of round wood = 35.28 cubic feet, b. 1 metric ton of woodfuel = 1.38 cubic meters of roundwood and c. 1 Chatta of fuelwood stack = 20ft x 5 ft x 5 ft = 500 cft of woodfuel

Table: Roundwood and Woodfuel Removal from the Forest Areas

Product	Wood Removal in 000 cubic meters											
	1990/91	1991/92	1992/93	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03
Round Wood	28	36	24	33	56	53	39	46	50	77	54	81
Wood Fuel	91	58	178	93	144	409	41	44	30	69	41	63

11.3 Analysis and processing of national data

11.3.1 Calibration

Not needed

11.3.1 Estimation and forecasting

To take care of the variations in the quantity of annual removals, simple averages as indicated below have been developed to represent removals in 1990 and 2000. The average of removals in 2002 and 2003 has been assumed to be the expected removal in 2005.

Information year	Average during the period	Average Removal in 000 cubic meters	
		Round Wood	Fuelwood
1990	1990 to 1993	29	109
2000	1998 to 2002	61	49
2005	2002 and 2003	67	52

11.4 Reclassification into FRA 2005 classes

Table: Reclassification (percentage allocation) into FRA 2005 classes

Category	Percentage allocation of a national class to a FRA class	
	Industrial Roundwood	Woodfuel
Roundwood/sawn wood	100	-
Firewood	-	100

11.5 Data for National reporting table T11

FRA 2005 Categories	Volume in 1000 cubic meters of roundwood over bark					
	Forest			Other wooded land		
	1990	2000	2005	1990	2000	2005
Industrial roundwood	29	61	67	n.a.	n.a.	n.a.
Woodfuel	109	49	52	n.a.	n.a.	n.a.
TOTAL for Country	**138**	**111**	**119**	n.a.	n.a.	n.a.

11.6 Comments to National reporting table T11

1. The figure of wood removal refers to the amount of round wood, sawn timber and fuelwood sold by the Department of Forests, The Timber Corporation of Nepal and Forest Product Development Board. It doesn't mean the harvested figure of wood removal.
2. The presented figure of wood removal doesn't indicate the source whether it comes from forest or shrub land. However, the entire amount of wood removal has been placed under the forest category.
3. The total amount of round wood and sawn timber removal has been included within the category of roundwood for the years 1990/91 and 1991/92.

12 Table T12 – Value of wood removal

The information on value of wood removal provides the monetary contribution of forestry sector to the national revenue generation that ultimately help support policy and planning makers for future planning.

12.1 FRA 2005 Categories and definitions

Category	Definition
Value of industrial wood removal	Value of the wood removed for production of goods and services other than energy production (woodfuel).
Value of woodfuel removal	Value of the wood removed for energy production purposes, regardless whether for industrial, commercial or domestic use.

12.2 National data

12.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year
HMGN, 1995. Forest Act 1993 and Forest Regulation 1995. Ministry of Forest and Soil Conservation, Nepal	H	Legal definitions	1993 1995
MoF, 1992. Economic Survey, Fiscal Year 1991/92. HMGN, Ministry of Finance, Kathmandu	H	Value of wood removal	1992
DoF, 1994. Department of Forest: an Introduction. Department of Forests, Kathmandu, Nepal	H	Value of wood removal	1994
DoF, 1999. Department of Forest: Annual Report (Fiscal year 1997/98). Department of Forests, Kathmandu, Nepal	H	Value of wood removal	1999
DoF, 2002. Hamro Ban. Department of Forests, Kathmandu, Nepal	H	Value of wood removal	2002
DoF, 2003. Hamro Ban (Fiscal Year 2001/02). Department of Forests, Kathmandu, Nepal	H	Value of wood removal	2003
DoF, 2004. Hamro Ban (Fiscal Year 2002/03). Department of Forests, Kathmandu, Nepal	H	Value of wood removal	2004
HMGN/FINNIDA, 1998. Strategic Guidelines for Forest Utilization. Main Report. FRIS Project Paper no. 10. Forest Resource Information System Project (FRIS), Nepal	H	Value of wood removal	1998
HMGN/ADB/FINNIDA, 1988. Master Plan for the Forestry Sector in Nepal. Ministry of Forest and Soil Conservation, Kathmandu, Nepal.	H	Value of wood removal	1985-86
NRB, 2003. Quarterly Economic Bulletin. Vol XXXVII. Nepal Rastra Bank. Kathmandu, Nepal. Web: www.nrb.org.np	H	Foreign Exchange	2003

12.2.2 Classification and definitions

There no national definitions relating to value of wood removal

12.2.3 Original data

Round wood	Million NRs.	1990 /91	1991 /92	1992 /93	1994 /95	1995 /96	1996 /97	1997 /98	1998 /99	1999 /00	2000 /01	2001 /02	2002 /03
		NA	NA	74	311	335	362	187	200	329	395	359	437

The value of wood is included with value of roundwood.

12.3 Analysis and processing of national data

12.3.1 Estimation and forecasting

To take care of the variations in the value of annual removals, simple averages as indicated below have been developed to represent average value in 1990 and 2000. The simple average of values in 2002 and 2003 (last two years for which data is available) has been assumed to be the expected value in 2005 considering almost constant prices of wood during last five years. The value of wood removal herein refers to the farm gate prices.

Information year	Average during the period	Average Value in million Nepalese Rupees	
		Round Wood	Fuelwood
1990	1990 to 1993	74	Included with wood
2000	1998 to 2002	344	Included with wood
2005	2002 and 2003	398	Included with wood

The conversion rate of US dollar to Nepali currency for the year 1990 and 2000 are as follows:

Table: Conversion Rate of Nepali Currency (NRs) to US $ for 1990 and 2000

Year	Unit	Currency	Conversion rate
1990	1	US $	42.9 NRs
2000	1	US $	71.1 NRs
2005	1	US$	70.95 NRs

Source: for 1990 and 2000 -NRB, 2003 and for 2005 http://www.imf.org/external/np/fin/rates/rms_rep.cfm.

12.4 Reclassification into FRA 2005 classes

Table: Reclassification (percentage allocation) into FRA 2005 classes

Category	Percentage allocation of a national class to a FRA class	
	Industrial Roundwood	Woodfuel
Roundwood/sawn wood	100	-
Firewood	-	100

12.5 Data for National reporting table T12

FRA 2005 Categories	Value of roundwood removal (1000 USD)					
	Forest			Other wooded land		
	1990	2000	2005	1990	2000	2005
Industrial roundwood	1725	4838	5610	NA	NA	NA
Woodfuel	Included above	Included above	Included above	NA	NA	NA
TOTAL for Country	**1725**	**4838**	**5610**	NA	NA	NA

12.6 Comments to National reporting table T12

13 Table T13 – Non-wood forest product removal

Non-wood forest products are also a source of revenue coming from the forest areas. They are also a component of livelihood strategy of local people mainly in remote areas of the country. There is also large opportunity of generating revenue from this sector.

13.1 FRA 2005 Categories and definitions

The following categories of non-wood forest products have been defined:

Category
Plant products / raw material
1. Food
2. Fodder
3. Raw material for medicine and aromatic products
4. Raw material for colorants and dyes
5. Raw material for utensils, handicrafts & construction
6. Ornamental plants
7. Exudates
8. Other plant products
Animal products / raw material
9. Living animals
10. Hides, skins and trophies
11. Wild honey and bee-wax
12. Bush meat
13. Raw material for medicine
14. Raw material for colorants
15. Other edible animal products
16. Other non-edible animal products

13.2 National data

13.2.1 Data sources

References to sources of information	**Quality (H/M/L)**	**Variable(s)**	**Year**
DoF, 1994. Department of Forest: an Introduction. Department of Forests, Kathmandu, Nepal	H	Amount NTFP removal	1994
DoF, 1999. Department of Forest: Annual Report (Fiscal year 1997/98). Department of Forests, Kathmandu, Nepal	H	Amount NTFP removal	1999
DoF, 2002. Hamro Ban. Department of Forests, Kathmandu, Nepal	H	Amount NTFP removal	2002
DoF, 2003. Hamro Ban (Fiscal Year 2001/02). Department of Forests, Kathmandu, Nepal	H	Amount NTFP removal	2003
DoF, 2004. Hamro Ban (Fiscal Year 2002/03). Department of Forests, Kathmandu, Nepal	H	Amount NTFP removal	2004
HMGN/ADB/FINNIDA, 1988. Master Plan for the Forestry Sector in Nepal. Ministry of Forest and Soil Conservation, Kathmandu, Nepal.	H	Amount NTFP removal	1985-86
HMGN/FINNIDA, 1995. Minor Forest Products of Nepal: General Status and Trend. FRIS Project Paper no. 4. Forest Resource Information System Project (FRIS), Kathmandu, Nepal	H	Amount NTFP removal	1995
FAO. 2002. Non Wood Forest Products in 15 Countries of Tropical Asia an Overview. FAO, Rome, Italy. (http://www.fao.org/documents/show_cdr.asp?url_file=/DOCREP/005/AB598E/AB598E22.htm)	H	Amount NTFP removal	1995 to 1999

13.2.2 Classification and definitions

National class	Definition
Forest Products	The following products which are contained or found in or brought from forests: • Timber, firewood, charcoal. catechu, rosin, wood-oil, bark, lac, pipla, pipli (*piper longum*), or • Trees, leaves, fruits, flowers, mahwa (*bassia longifolia*), chiraito (*swertia chiretta*), Kutki (*Picorhiza kurroa*) and all kinds of wild herbs, vegetation and different parts or organs thereof, or • Boulders, soil, stones, pebbles, sand, or • Birds, wildlife and trophies thereof.
Minor Forest Product	All forest product other than timber, fuelwood and fodder

13.2.3 Original data

FAO, 2003 provides a comprehensive information on the NWFP in Nepal. The national data on removal of NWFP is quite weak. FAO, 2003 provides quantity of sale of NWFP in Nepal during 1995 to 1999.

Year	1995/1996	1996/1997	1997/1998	1998/1999	1999/2000
NWFP Sale (MT)	3233.49	3748.67	15084.47	2690.77	1550.00

13.3 Analysis and processing of national data

13.3.1 Estimation and forecasting

The figure for 1995 is being assumed for 1990. The average of figures from 1998 to 1999 is being assumed for 2000 and 2005.

Year	1990	2000	2005
NWFP Sale (MT)	3233	2121	2121

13.4 Reclassification into FRA 2005 classes

Table: Reclassification (percentage allocation) into FRA 2005 classes

Category	Percentage allocation of a national class to a FRA class	
	Plant products/raw materials	Animal products/raw materials
NWFP	100	-

13.5 Data for National reporting table T13

FRA 2005 Categories	Scale factor	Unit	NWFP removal		
			1990	2000	2005
Plant products / raw material			i.d	i.d	i.d.
1. Food					
2. Fodder					
3. Raw material for medicine and aromatic products					
4. Raw material for colorants and dyes					
5. Raw material for utensils, handicrafts & construction					
6. Ornamental plants					
7. Exudates					
8. Other plant products					
Animal products / raw material			n.d.a	n.d.a	n.d.a
9. Living animals					
10. Hides, skins and trophies					
11. Wild honey and bee-wax					
12. Bush meat					
13. Raw material for medicine					
14. Raw material for colorants					
15. Other edible animal products					
16. Other non-edible animal products					

13.6 Comments to National reporting table T13

1. The amount NWFP removal presented in the original and reporting table are only the figure of quantity sold and not the harvested figure.
2. The amount of NWFP in FRA reporting table doesn't include the amount of animal products because the amount of animal products in the total NWFP amount is very insignificant (less than 0.1 percent).
3. Although Forest Laws, 1993 and Regulations 1995 has defined boulders, soils, sand, stone and pebbles as forest products, the amount of such products are not included here as the Non-Wood Forest Products.

14 Table T14 – Value of non-wood forest product removal

Non-wood forest products are also a source of revenue coming from the forest areas. They are also a component of livelihood strategy of local people mainly in remote areas of the country. There is also large opportunity of generating revenue from this sector.

14.1 FRA 2005 Categories and definitions

The following categories of non-wood forest products have been defined:

Category
Plant products / raw material
1. Food
2. Fodder
3. Raw material for medicine and aromatic products
4. Raw material for colorants and dyes
5. Raw material for utensils, handicrafts & construction
6. Ornamental plants
7. Exudates
8. Other plant products
Animal products / raw material
9. Living animals
10. Hides, skins and trophies
11. Wild honey and bee-wax
12. Bush meat
13. Raw material for medicine
14. Raw material for colorants
15. Other edible animal products
16. Other non-edible animal products

14.2 National data

14.2.1 Data sources

References to sources of information	**Quality (H/M/L)**	**Variable(s)**	**Year**
DoF, 1994. Department of Forest: an Introduction. Department of Forests, Kathmandu, Nepal	H	Amount NTFP removal	1994
DoF, 1999. Department of Forest: Annual Report (Fiscal year 1997/98). Department of Forests, Kathmandu, Nepal	H	Amount NTFP removal	1999
DoF, 2002. Hamro Ban. Department of Forests, Kathmandu, Nepal	H	Amount NTFP removal	2002
DoF, 2003. Hamro Ban (Fiscal Year 2001/02). Department of Forests, Kathmandu, Nepal	H	Amount NTFP removal	2003
DoF, 2004. Hamro Ban (Fiscal Year 2002/03). Department of Forests, Kathmandu, Nepal	H	Amount NTFP removal	2004
HMGN/ADB/FINNIDA, 1988. Master Plan for the Forestry Sector in Nepal. Ministry of Forest and Soil Conservation, Nepal.	H	Amount NTFP removal	1985-86
HMGN/FINNIDA, 1995. Minor Forest Products of Nepal: General Status and Trend. FRIS Project Paper no. 4. Forest Resource Information System Project (FRIS), Kathmandu, Nepal	H	Amount NTFP removal	1995
FAO. 2002. Non Wood Forest Products in 15 Countries of Tropical Asia an Overview. FAO, Rome, Italy. (http://www.fao.org/documents/show_cdr.asp?url_file=/DOCREP/005/AB598E/AB598E22.htm)	H	Amount NTFP removal	1995 to 1999

13.2.2 Classification and definitions

There are no national classification and definition on value of NWFP.

13.2.3 Original data

FAO, 2003 provides a comprehensive information on the NWFP in Nepal. The national data on removal of NWFP is quite weak. FAO, 2003 provides information on revenue generated from sale of NWFP in Nepal during 1995 to 1999.

Year	1995/1996	1996/1997	1997/1998	1998/1999	1999/2000
Revenue (US$ millions)	0.29	0.35	0.35	0.22	0.16

14.3 Analysis and processing of national data

14.3.1 Calibration

Not needed.

14.3.1 Estimation and forecasting

The revenue figures for 1995 is being assumed for 1990 and the average of figures from 1998 to 1999 is being assumed for 2000 and 2005.

Year	1990	2000	2005
Revenue (US$ millions)	0.29	0.19	0.19

14.4 Reclassification into FRA 2005 classes

Table: Reclassification (percentage allocation) into FRA 2005 classes

Category	Percentage allocation of a national class to a FRA class	
	Plant products/raw materials	Animal products/raw materials
NWFP	100	-

14.5 Data for National reporting table T14

FRA 2005 Categories	Value of the of NWFP removed (1000 USD)		
	1990	2000	2005
Plant products / raw material 1. Food	**i.d**	**i.d**	**i.d.**
2. Fodder			
3. Raw material for medicine and aromatic products			
4. Raw material for colorants and dyes			
5. Raw material for utensils, handicrafts & construction			
6. Ornamental plants			
7. Exudates			
8. Other plant products			
Animal products / raw material	n.d.a	n.d.a	n.d.a

9. Living animals			
10. Hides, skins and trophies			
11. Wild honey and bee-wax			
12. Bush meat			
13. Raw material for medicine			
14. Raw material for colorants			
15. Other edible animal products			
16. Other non-edible animal products			
TOTAL			

14.6 Comments to National reporting table T14

15 Table T15 – Employment in forestry

15.1 FRA 2005 Categories and definitions

Category	Definition
Primary production of goods	Employment in activities related to primary production of goods, like industrial roundwood, woodfuel and non-wood forest products.
Provision of services	Employment in activities directly related to services from forests and woodlands.
Unspecified forestry activities	Employment in unspecified forestry activities.

15.2 National data

15.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)
DoF, 2004. Hamro Ban (Fiscal Year 2002/03). Department of Forests, Kathmandu, Nepal	H	Employment Statistics	2004
DPR, 2004. Annual Report (Fiscal Year 2059/60). Department of Plant Resources, Kathmandu, Nepal	H	Employment Statistics	2004
DFRS, 2004. Annual Report (Fiscal Year 2060/61). Department of Forest Research and Survey, Kathmandu, Nepal.	H	Employment Statistics	2004
MoFSC, 2003. Human Resources Strategy Report (draft version). Ministry of Forest and Soil Conservation, Nepal.	H	HRD policy document	2003
Personal Communication to The Timber Corporation of Nepal, Forest Product Development Board, Department of National Parks and Wildlife Conservation, Department of Soil Conservation and Watershed Management, Herbs Production and Processing Company Limited.	H	Employment statistics	2004
HMGN/ADB/FINNIDA, 1988. Master Plan for the Forestry Sector in Nepal. Human Resources Development Plan. Ministry of Forest and Soil Conservation, Kathmandu, Nepal.	H	HRD policy	1985-86

15.2.2 Classification and definitions

No national standard definitions are available.

15.2.3 Original data

The Master plan for Forestry Sector provides following estimates of employment in 1990.

Category	Employment (000 person years)
HMGN Employment – Regular Staff	13
Employment - Forestry Operations	
Forest Establishment	30.4
Soil Conservation and Watershed	5.9
Timber Harvesting	95.3
Sub Total	131.6
TOTAL	**144.6**

15.3 Analysis and processing of national data

15.3.1 Estimation and forecasting

The estimate of employment for the year 1990 has been taken from Master Plan for the Forestry Sector of Nepal, 1988. The employment under HMGN has been apportioned to "services" based on the ratio of the conservation area (about 8%) to the total area of forest in Table 4. Similarly employment relating to soil conservation and watershed has been apportioned to "services". The remaining employment through HMGN and other employment has been apportioned to "production". This information coupled with information on forest area provides following estimates of per hectare employment through "provision of services" and "provision of goods".

Category	Conservation	Rest	Total
Forested Area (000 ha) in 1990	391	4426	4817
Employment /ha in 1990	0.01779	0.031099	0.048888

Using above estimated have lead to the following estimates of total employment.

Employment Categories	Employment (1000 person-years)	
	1990	2000
Provision of goods	137.6	96.1
Provision of services	7.0	14.4
Unspecified forestry activities		
TOTAL	**144.6**	**100,5**

15.4 Reclassification into FRA 2005 classes

Table: Reclassification (percentage allocation) into FRA 2005 Class

National Category	Percentage of a national class belonging to a FRA class		
	Primary production of goods	Provision of Services	Unspecified Forestry Activities
Labour employment	100		
Direct employment		100	
Unspecified Forestry Activities			100

15.5 Data for National reporting table T15

FRA 2005 Categories	Employment (1000 person-years)	
	1990	2000
Primary production of goods	137.6	96.1
Provision of services	7.0	14.4
Unspecified forestry activities		
TOTAL	**144.6**	**100.5**

15.6 Comments to National reporting table T15

The employment figure under the category of primary production of excludes the employment in fuelwood and fodder collection, which is mainly voluntary.