Forestry Department
Food and Agriculture Organization of the United Nations

GLOBAL FOREST RESOURCES ASSESSMENT 2010

COUNTRY REPORT

PAKISTAN

FRA2010/158
Rome, 2010

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 2010 (FRA 2010).

The reporting framework for FRA 2010 is based on the thematic elements of sustainable forest management acknowledged in intergovernmental forest-related fora and includes variables related to the extent, condition, uses and values of forest resources, as well as the policy, legal and institutional framework related to forests. More information on the FRA 2010 process and the results - including all the country reports - is available on the FRA Web site (www.fao.org/forestry/fra).

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 2010 is:

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Contents

Report preparation and contact persons

No report has been received from Pakistan.

This report is the result of a desk study prepared by the FRA secretariat in Rome, which summarizes existing available information using the established format for FRA 2010 country reports.

1 Table T1 – Extent of Forest and Other wooded land

1.1 FRA 2010 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

1.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
GOP. 1992. Forestry Sector Master Plan 1992. Reid, Collins and Associates, Canada, and Silviconsult Ltd. Sweden.	H	Area	1990	
GOP. 2004. National Forest and Rangeland Resource Assessment Pakistan Forest Institute, Peshawar. 2004.	M	Area	1990, 2000	

1.2.2 Classification and definitions

National class	Definition
Coniferous Forests	These forests mostly grow in the north and north west hilly regions of Pakistan between an elevation of 1000m and 3500m.
Sub-Alpine	*Betula utilis* (Birch, Bhuj), *Abies pindrow* (Fir, Paludar)
Himalayan Moist Temperate	*Abies pindrow* (Fir, Palundar), *Picea smithiana* (Spruce, Kachal), *Cedrus deodara* (Deodar), *Pinus wallichiana* (Kail, Biar), *Taxus baccata* (Yew), *Aesculus indica* (Bankhor), *Juglans regia* (Akhrot, Khor), *Populus ciliata* (Palach), *Quercus dilatita* (Oak), *Acer caesium* (Tarkan), *Prunus padus* (Kalakath).
Dry Temperate	*Pinus wallichiana*(Kail, Biar), *Cedrus deodara* (Deodar), *Juniperus excelsa* (Shur, Shupa),*Pinus gerardiana* (Chilgoza), *Quercus ilex* (Bani, Breh).
Sub-Tropical Pine	*Pinus roxburghii* (Chir, Chil), *Quercus incana* (Rin, Ring), *Rhododendron arboreum* (Chahan, Bras).

Scrub Forests	These forests grew upto 1000m in elevation in the north and north western regions of Pakistan. Main Species are following *Acacia modesta*(Phulai), *Olea ferruginea* (Kau), *Acacia nilotica* (Kikar, Babul).
Tropical Thorn	*Acacia nilotica* (Kikar, Babul), *Acacia modesta* (Phulai), *Prosopis cineraria* (Jand, Kandi), *Salvadora oleoides cineraria* (Wan, Pilu), *Zizyphus mauritiana* (Ber), *Tamarix aphylla* (Farash, Ghaz), *Tecoma undulata* (Lahura), *Nannorrhops ritchieana (Mazri)*
Riverain Forests	*Acacia nilotica* (Kikar, Babul), *Dalbergia sissoo* (Shisham, Tali), *Prosopis cineraria* (Jand, Kandi) *Tamarix dioica* (Lei, Dilchhi), *Populus euphratica* (Bahn).
Mangrove Forests	*Avicennia marina* (Timur), *Ceriops tagal* (Chowree or Kirree).
Irrigated Plantations	*Dalbergia sissoo*(Shisham, tali), *Morus alba* (Toot), *Salmalia malabarica* (Simal), *Populus deltoides* (Sofeda, Poplar), *Eucalyptus camaldulensis* (Lachi, Safeda), *Acacia nilotica* (Kikar, Babul).
Linear Plantations Along Canals, Roads And Railway Lines.	Same as above and some ornamental species such as *Bauhinia variegata* (Kachanar), *Jacaranda mimosefolia* (Nila Gul Mohr, Jacaranda), *Cassia fistula* (Amaltas), etc.

The names of tree species in parenthesis are local/English.

1.2.3 Original data

A. For 1990

Landuse (000 ha) in Forest Sector Master Plan, 1992

Country classification	**Area (000 ha)**
Conifer –Dense	138
Conifer –Sparse	1775
Scrub	1191
Riverain – Dense	115
Riverain – Medium	58
Mangrove – Medium	87
Mangrove – Sparse	120
Irrigated Plantation	103
Other Plantation (Linear Plantation 16 + Misc.155+Farm trees 466)	637
Rangelands	28507
Agriculture	20580
Other land (Barren 26893+ Urban 138 + Unclassified 6725)	33756
Water Bodies	913
Total land area (000 ha)	**87980**

(Source: GOP, 1992)

B. For 2000

Country classification	**1990**	**1996**	**2000**
Conifer	1913	1479	1512
Riverain	173	144	150
Mangrove	207	159	158
Plantation	103	165	174
Scrub	1191	1652	1323
Grand Total	**3587**	**3599**	**3317**

(Source: GOP, 2004)

C. Updated Figures on Plantations

	Plantation area in "000 ha			
Year	**Irrigated**	**Farm Land**	**Linear Plantation**	**Total**
1992	234	466	16	716
2000	296	663	21	980
2004	318	781	17	1116

(Source: Email communication NC)

1.3 Analysis and processing of national data

1.3.1 Calibration

(i) Classification of Forest Areas

A. For 1990

Category	Allocation to a FRA Class
Coniferous	Forest
Riverine	Forest
Coastal	Forest
Irrigated plantations	Forest but this figure is not used
Scrub	Other Wooded land
Mazri lands	Other land
Linear plantations	Other land
Other Plantations (Linear, Private, Farm trees, Misc. Plantings)	Other land
Rangelands	Other land
Agriculture	Other land
Other land (Barren + Urban + Unclassified)	Other land
Water Bodies	Inland Water bodies

B. For 2000

Category	Allocation to a FR A Class
Conifers	Forest
Riverain	Forest
Mangrove	Forest
Plantation	Forest but this figure is not used
Scrub	Other Wooded Land

C. Plantations

The updated figures on plantation have been used. The "irrigated plantations" have been treated as forest plantations and classified as forests. Their figures for 1992 are being assumed for 1990 and that for 2004 for 2005. There is no information available regarding minimum area and width etc. of farm plantations and the linear plantations to qualify them as "other land with tree cover", therefore these plantation areas are being added to "other land".

(ii) Area Calibrations

The country area figure (79610000) and inland water area figure (2522000 ha) of Pakistan maintained by U.N Statistical Division at New York do not match with the area figures reported above. Therefore, there is a need to calibrate the area. This has been achieved by adjusting all the differences in area of the other land as shown in the table below.

Category of landuse	**Area in 000 ha**	
	1990	**2000**
Forests (Excl. Plantation)	2293	1820
Irrigated Plantation (Forests)	234	296
Other Wooded Land	1191	1323
..of which Other land with trees		
Other land	73370	73649
Inland water bodies	2522	2522
Total Country Area	**79610**	**79610**

1.3.2 Estimation and forecasting

The linear interpolation method (Area in 2005 = {area in 2000 + ((Area in 2000-Area in 1990)/(2000-1990))*(2005-2000)} has been used to forecast the areas under "Forests" and "Other Wooded lands" for 2005 and due to lack of updated figures also for 2010.
For plantations the 2004 figure has been used for 2005 and the 2010 was derived from linear extrapolation using 2000 and 2005 figures.

Category of landuse	**1990**	**2000**	**2005**	**2010**
Forests (Excluding Plantations)	2293	1820	1584	1347
Irrigated Plantation (Forests)	234	296	318	340
Other Wooded Land	1191	1323	1389	1455
Other land with trees				
Other land	73370	73649	73797	73946
Inland water bodies	2522	2522	2522	2522
Total Country Area	**79610**	**79610**	**79610**	**79610**

1.3.3 Reclassification into FRA 2010 categories

Reclassification has been done prior to estimation and forecasting.

1.4 Data for Table T1

FRA 2010 categories	Area (1000 hectares)			
	1990	2000	2005	2010
Forest	2 527	2 116	1 902	1 687
Other wooded land	1 191	1 323	1 389	1 455
Other land	73 370	73 649	73 797	73 946
...of which with tree cover	n.a.	n.a.	n.a.	n.a.
Inland water bodies	2 522	2 522	2 522	2 522
TOTAL	**79 610**	**79 610**	**79 610**	**79 610**

1.5 Comments to Table T1

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Forest		
Other wooded land		
Other land		
Other land with tree cover	There is no information available regarding minimum area and width etc. of farm plantations and the linear plantations to qualify them as "other land with tree cover", therefore these plantation areas are being added to "other land".	
Inland water bodies		

Other general comments to the table
There are some positive indications of farmers' interest in tree plantings. The Government of Pakistan is trying its best to reduce the current deforestation rate through community participation, allocating more funds for forestry projects in the country, offering more incentives to the tree growers to raise plantations under agro-forestry and social forestry programmes and finding suitable tree species for waterlogged , saline and arid lands.

Expected year for completion of ongoing/planned <u>national</u> forest inventory and/or RS survey / mapping	
Field inventory	
Remote sensing survey / mapping	

2 Table T2 – Forest ownership and management rights

2.1 FRA 2010 Categories and definitions

Category	Definition
Public ownership	Forest owned by the State; or administrative units of the public administration; or by institutions or corporations owned by the public administration.
Private ownership	Forest owned by individuals, families, communities, private co-operatives, corporations and other business entities, private religious and educational institutions, pension or investment funds, NGOs, nature conservation associations and other private institutions.
Individuals *(sub-category of Private ownership)*	Forest owned by individuals and families.
Private business entities and institutions *(sub-category of Private ownership)*	Forest owned by private corporations, co-operatives, companies and other business entities, as well as private non-profit organizations such as NGOs, nature conservation associations, and private religious and educational institutions, etc.
Local communities *(sub-category of Private ownership)*	Forest owned by a group of individuals belonging to the same community residing within or in the vicinity of a forest area. The community members are co-owners that share exclusive rights and duties, and benefits contribute to the community development.
Indigenous / tribal communities *(sub-category of Private ownership)*	Forest owned by communities of indigenous or tribal people.
Other types of ownership	Other kind of ownership arrangements not covered by the categories above. Also includes areas where ownership is unclear or disputed.
Categories related to the holder of management rights of public forest resources	
Public Administration	The Public Administration (or institutions or corporations owned by the Public Administration) retains management rights and responsibilities within the limits specified by the legislation.
Individuals/households	Forest management rights and responsibilities are transferred from the Public Administration to individuals or households through long-term leases or management agreements.
Private institutions	Forest management rights and responsibilities are transferred from the Public Administration to corporations, other business entities, private co-operatives, private non-profit institutions and associations, etc., through long-term leases or management agreements.
Communities	Forest management rights and responsibilities are transferred from the Public Administration to local communities (including indigenous and tribal communities) through long-term leases or management agreements.
Other form of management rights	Forests for which the transfer of management rights does not belong to any of the categories mentioned above.

2.2 National data

2.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
IUCN. 1998. Changing Perspectives on forest policy. Editor: James Mayers. Authors Javed Ahmed and Fawad Mahmood. IUCN in Collaboration with Government of Pakistan.1998.	H	Ownership	1990	

2.2.2 Classification and definitions

National class	Definition
State Owned Forests	State owned forests are forests on state owned lands. These forest lands include reserved forests, protected forests, unclassed forests, municipal and resumed lands.
Private Owned Forests	Private owned forests are a broad category encompassing all forests held in private ownership. These includes Guzara forests, Communal Forests, Chos Act Areas, Section 38 areas and Forests on farmlands
Reserved Forests	The forests under the control of Forest Department which have been declared as Reserved Forests under Forest Act 1927 and are generally without rights and privileges. The ownership is vested in government.
Protected Forests	The forests which have been declared as Protected Forests under the provision of the Forest Act 1927 and have some rights and concessions of grazing, grass cutting and collection of dry wood etc. The ownership is vested in the government.
Unclassed Forests	The public forest lands under the control of Forests Department which are neither Reserved Forests nor Protected Forests and are known as unclassed forests. The ownership is vested in government.
Municipal Forest	The forests whose control has been transferred from Forest Department to Municipal and Cantonment authorities. The ownership is vested in the government.
Resumed Lands	Private lands taken over by the Government under various land reforms and Martial Law regulations and managed by the Forest Departments. The ownership is vested in the government.
Guzara Forests	The forest areas to meet bona fide domestic needs of local communities. These forests are managed by the Forest Department.
Community Forests	This I sub category of “Guzara” where the forests are owned by the entire village. These forests are managed by the Forest Department. The ownership is vested in local people either as individual or as joint property known as “village shamilat”.
Chos Act Forests	Private lands, subject to erosion, taken over by the government for the purpose of soil and water conservation under the Punjab Land Preservation (Chos) Act, 1900. The ownership remains private..
Section 38 Areas	Privately owned lands voluntarily and temporarily put under the control of Punjab Forest Department for conservation and preservation of soil and vegetation. The ownership remains private.

2.2.3 Original data

A. From IUCN (1998) for 1990

Category of Forest Land	Area in 000 ha
State Owned	
Reserved	1682
Protected	994
Un-classed	43
Municipal	208
Resumed	100
Sub-total	3027 (66%)
Privately Owned	
Guzara	622
Chos	3
Section 38	48
Communal	878
Sub-total	1551 (34%)
Total	4578 (100%)

The figures in bracket reflect the percentages to the total area of forest land.

2.3 Analysis and processing of national data

2.3.1 Estimation and forecasting

The relative percentage of private (34%) and publicly (66%) owned forest lands for 1990 has been applied to the area of "forests" reported in Table 1 for 1990, 2000 and 2010.

2.4 Data for Table T2

Table 2a - Forest ownership

FRA 2010 Categories	Forest area (1000 hectares)		
	1990	2000	2005
Public ownership	1668	1397	1255
Private ownership	859	719	647
...of which owned by individuals	n.a.	n.a.	n.a.
...of which owned by private business entities and institutions	n.a.	n.a.	n.a.
...of which owned by local communities	n.a.	n.a.	n.a.
...of which owned by indigenous / tribal communities	n.a.	n.a.	n.a.
Other types of ownership	0	0	0
TOTAL	**2 527**	**2 116**	**1 902**

Does ownership of trees coincide with ownership of the land on which they are situated?		Yes
		No
If **No** above, please describe below how the two differ:		

Table 2b - Holder of management rights of public forests

FRA 2010 Categories	Forest area (1000 hectares)		
	1990	2000	2005
Public Administration	n.a.	n.a.	n.a.
Individuals	n.a.	n.a.	n.a.
Private corporations and institutions	n.a.	n.a.	n.a.
Communities	n.a.	n.a.	n.a.
Other	n.a.	n.a.	n.a.
TOTAL	n.a.	n.a.	n.a.

2.5 Comments to Table T2

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Public ownership		
Private ownership		
Other types of ownership		
Management rights		

Other general comments to the table

3 Table T3 – Forest designation and management

3.1 FRA 2010 Categories and definitions

Term	Definition
Primary designated function	The primary function or management objective assigned to a management unit either by legal prescription, documented decision of the landowner/manager, or evidence provided by documented studies of forest management practices and customary use.
Protected areas	Areas especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means.
Categories of primary designated functions	
Production	Forest area designated primarily for production of wood, fibre, bio-energy and/or non-wood forest products.
Protection of soil and water	Forest area designated primarily for protection of soil and water.
Conservation of biodiversity	Forest area designated primarily for conservation of biological diversity. Includes but is not limited to areas designated for biodiversity conservation within the protected areas.
Social services	Forest area designated primarily for social services.
Multiple use	Forest area designated primarily for more than one purpose and where none of these alone is considered as the predominant designated function.
Other	Forest areas designated primarily for a function other than production, protection, conservation, social services or multiple use.
No / unknown	No or unknown designation.
Special designation and management categories	
Area of permanent forest estate (PFE)	Forest area that is designated to be retained as forest and may not be converted to other land use.
Forest area within protected areas	Forest area within formally established protected areas independently of the purpose for which the protected areas were established.
Forest area under sustainable forest management	To be defined and documented by the country.
Forest area with management plan	Forest area that has a long-term (ten years or more) documented management plan, aiming at defined management goals, which is periodically revised.

3.2 National data

3.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
WI. 1993. Review and Analysis of Forest Policies of Pakistan by Abeed Ullah Jan 1993. Winrock International, FPDP, Government of Pakistan.	M	Designation	1990	
GOP. Economic Survey 1999-2000. Government of Pakistan	H	Designation	2000	
WWF Pakistan. 2005. Website on Protected Areas	H	Protected Areas	2004	

3.2.2 Classification and definitions

National class	Definition
Protection Forest	Forests managed for the biological stabilities.
Production Forest	Forests managed for timber requirements.

3.2.3 Original data

A. Percentage of Productive and Protective Forests in 1990 and 2000 (GOP and WI)

Category	Productive		Protective		Total (000 ha)
	Area (000 ha)	Percentage	Area (000 ha)	Percentage	
Forests					
1990	837	28	2196	72	3033
2000	830	32	1780	68	2610
Scrub Forests					
1990	329	28	862	72	1191
2000	452	32	970	68	1422

B. Area of Protected Areas (WWF- Pakistan Website)

National Parks	Region	Area in ha	Year of Establishment
Lal Suhanra	Punjab	51,588	1972
Kirthar	Sindh	308,733	1974
Khunjerab	Northern Areas	227,143	1975
Hazarganji-Chiltan	Balochistan	15,555	1980
Margalla Hills	Federal Capital Territory	17,386	1980
Ayubia	North West Frontier Province	1,684	1984
Chitral Gol	North West Frontier Province	7,750	1984
Chinji	Punjab	6,070	1987
Deosai Plains	Northern Areas	363,600	1993
Handrap Shandhoor	Northern Areas	51,800	1993
Sheikh Buddin	North West Frontier Province	15,540	1993
Central Karakoram	Northern Areas	973,845	1995
Machiara	AJK	13,593	1996
Hingol	Balochistan	699,088	1997

In addition to national parks, there are 82 wildlife sanctuaries on 2,749,054 ha, and 82 game reserves on 3,535,284 ha (www.fao.org/docrep/003/x6900e/x6900e0o.htm) but their year of establishment is not available. It has been assumed that these were established before 1990.

Variable	Area in 000 ha		
	1990	2000	2005
Protected Area	636	2753	2753
Wild life Sanctuaries	2749	2749	2749
Game Reserve	3535	3535	3535
Total PA	6920	9038	9038

3.3 Analysis and processing of national data

Assumptions

(a) The productive forest mainly serves productive function
(b) The protective areas mainly serve conservation of biodiversity function
(c) All forest areas less productive forests and those that are under "protected areas" are used as multipurpose forests.

Estimation

A. Productive forests

Following the original data, it is assumed that 28% of the "forests" and "other wooded lands" served production function in 1990 and about 32 % of them in the year 2000. It is assumed that the percentage for 2000 applies to 2005 and due to a lack of updated figures to 2010 as well.

Variable	1990	2000	2005	2010
Percent of Productive forest	28	32	32	32
Area of Productive Forests in "000"ha	708	677	608	540

B. Protected Areas

Following tables indicates the area of forests serving specific function of the conservation of biodiversity. It is based on the assumption that the overall relative percentage between "forests" (3.2, 2.6 and 2.3) in the total area of the country in 1990, 2000 and 2005 as reflected in Table 1 also holds good for "protected areas".

Due to a lack of updated figures 2005 figure on protected forest has been used for 2010.

Variable	1990	2000	2005	2010
Percent of Forest in Table 1	3.2	2.7	2.4	
Area of Forests in PAs in "000"ha	220	240	216	216

B. Multipurpose Function

In view of non-availability of any documented data, the remainder of "forests" and "Other wooded lands" has been assumed to serve the multipurpose function.

3.4 Data for Table T3

Table 3a – Primary designated function

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Production	708	677	608	540
Protection of soil and water	0	0	0	0
Conservation of biodiversity	220	240	216	216
Social services	0	0	0	0
Multiple use	1 599	1 199	1 078	931
Other (please specify in comments below the table)	0	0	0	0
No / unknown	0	0	0	0
TOTAL	**2 527**	**2 116**	**1 902**	**1687**

Table 3b – Special designation and management categories

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Area of permanent forest estate	n.a.	n.a.	n.a.	n.a.
Forest area within protected areas	n.a.	n.a.	n.a.	n.a.
Forest area under sustainable forest management	n.a.	n.a.	n.a.	n.a.
Forest area with management plan	n.a.	n.a.	n.a.	n.a.

3.5 Comments to Table T3

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Production		
Protection of soil and water		
Conservation of biodiversity		
Social services		
Multiple use		

Other		
No / unknown designation		
Area of permanent forest estate		
Forest area within protected areas		
Forest area under sustainable forest management		
Forest area with management plan		

Other general comments to the table
In the absence of specific data, the above table is mainly based on assumptions

4 Table T4 – Forest characteristics

4.1 FRA 2010 Categories and definitions

Term / category	Definition
Naturally regenerated forest	Forest predominantly composed of trees established through natural regeneration.
Introduced species	A species, subspecies or lower taxon, occurring outside its natural range (past or present) and dispersal potential (i.e. outside the range it occupies naturally or could occupy without direct or indirect introduction or care by humans).
Characteristics categories	
Primary forest	Naturally regenerated forest of native species, where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed.
Other naturally regenerated forest	Naturally regenerated forest where there are clearly visible indications of human activities.
Other naturally regenerated forest of introduced species *(sub-category)*	Other naturally regenerated forest where the trees are predominantly of introduced species.
Planted forest	Forest predominantly composed of trees established through planting and/or deliberate seeding.
Planted forest of introduced species *(sub-category)*	Planted forest, where the planted/seeded trees are predominantly of introduced species.
Special categories	
Rubber plantations	Forest area with rubber tree plantations.
Mangroves	Area of forest and other wooded land with mangrove vegetation.
Bamboo	Area of forest and other wooded land with predominant bamboo vegetation.

4.2 National data

4.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
GOP. 1992. Forestry Sector Master Plan 1992. Reid, Collins and Associates, Canada, and Silviconsult Ltd. Sweden.	H	Area	1990	
IUCN. 1998. Changing Perspectives on forest policy. Editor: James Mayers. Authors Javed Ahmed and Fawad Mahmood. IUCN in Collaboration with Government of Pakistan.1998.	H	Area	1990	
FAO.2007. Mangroves of Asia, working paper 137		Mangroves		Secondary source

4.2.2 Classification and definitions

National class	Definition
	There are national classification and definitions relating to this table

4.2.3 Original data

No data is available about the characteristics of forests and other wooded lands. All the information incorporated in the Table 4 has been derived from earlier tables mainly Table 1 and Table 3 with following assumptions.

(a) There are no primary forests.

(b) Most of the forests are disturbed. These forests are under great pressure because of human activities, population pressure and increasing demand for fuelwood and timber. Unfortunately, in the past enough efforts were not made to raise the productive or protective plantations in those areas, which were earlier over harvested or cleared. All forests, excluding irrigated plantations have been classified as "other naturally regenerated forest".

(c) All irrigated plantations are for productive purposes. (See chapter 1.3.2).

Data for mangroves come from the FAO study on Mangroves which reports the followings:

Mangroves area ha	1997	2001
Area ha	159 000	158 000

Original source 1997: **Pakistan Forest Institute.** 2004 *National Forest and Rangeland Resource Assessment Study. Final Report.* Peshawar, Pakistan.

Original source 2001: **Pakistan Forest Institute.** 2004 *National Forest and Rangeland Resource Assessment Study. Final.*

For mangroves linear interpolation for 1990 and linear extrapolation for 2000 and 2005 has been used. For 2010 due to lack of updated figures same figure as 2005 has been used.

4.3 Data for Table T4

Table 4a

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Primary forest	0	0	0	0
Other naturally regenerated forest	2293	1820	1584	1347
...of which of introduced species	n.a	n.a	n.a	n.a
Planted forest	234	296	318	340
...of which of introduced species	n.a	n.a	n.a	n.a
TOTAL	**2 527**	**2 116**	**1 902**	**1687**

Table 4b

FRA 2010 Categories	Area (1000 hectares)			
	1990	2000	2005	2010
Rubber plantations (Forest)	n.a.	n.a.	n.a.	n.a.
Mangroves (Forest and OWL)	207	158	157	157
Bamboo (Forest and OWL)	n.a.	n.a.	n.a.	n.a.

4.4 Comments to Table T4

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Primary forest		
Other naturally regenerating forest		
Planted forest		
Rubber plantations		
Mangroves		
Bamboo		

Other general comments to the table

5 Table T5 – Forest establishment and reforestation

No data available

6 Table T6 – Growing stock

6.1 FRA 2010 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.
Growing stock of commercial species	Growing stock (see def. above) of commercial species.

6.2 National data

6.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
FSMP. 1992. Forestry Sector Master Plan 1992. Reid, Collins and Associates, Canada, and Silviconsult Ltd. Sweden.	H	Growing Stock	1990	
GOP. 1999. Biodiversity Action Plan. Government of Pakistan. Prepared with support from IUCN/WWF and financed by World Bank/GEF. August 1999	M	Growing Stock rate of decline	1992	
HESS. 1992. House Hold Energy Strategy Survey 1990 to 1992. Pakistan	M	Growing Stock	1990	

6.2.2 Classification and definitions

National class	Definition
Growing stock	Volume over bark of all living trees more than 4 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 1 cm, and may also include branches to a minimum diameter of 5 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 5 cm or more.

6.2.3 Original data

A complete national inventory of forest growing stock is not available. The working plans of forest department cover approximately 50 % of coniferous forests and contain estimates of volume, but many of these are based on outdated inventories. The FSMP (1992) compiled data of 29 working plans in NWFP, 3 in Punjab and 4 in AJK, and 3 working schemes in Northern Areas to provide following estimates of the growing stock in coniferous forests.

Province	Coniferous forests		Weighted GS per ha (m^3 /ha)
	Area (000ha)	GS per ha (m^3 /ha)	
AJK	241	169	
Northern Areas	660	90	
NWFP	940	132	
Punjab	30	246	
Ballochistan	42	n.a.	
Total	**1913**		**123.78**

The FSMP (1992) considered the estimates of growing stock of HESS (1992) for non-coniferous and non-farm areas and concluded that a national average of 39 m^3/ha for broad leaved (non-coniferous areas) were reasonable.

The GOP (1999) highlights the FSMP (1992) estimate of annual rate (4%) of decline in growing stock in its National Biodiversity Action Plan (1999).
A complete national inventory of forest growing stock is not available. The FSMP compiled data for 1.3 million ha area of 29 working plans in NWFP, 3 in Punjab and 4 in AJK, and 3 working schemes in Northern Areas and estimated following species-wise composition of the growing stock of coniferous forests These percentages are not for individual trees of these species, but for forest types dominated by one or two species.

Forest Types	Percent of Growing stock
Spruce/Fir (*Picea smithiana* and *Abies pindrow)*	39
Kail (*Pinus wallichiana*)	23
Deodar (*Cedrus deodara*)	18
Fir (*Abies pindrow*)	8
Spruce (*Picea smithiana*)	6
Chir (*Pinus roxburghii*)	4
Broad leaved	1
Scrub	1

Similar information on species composition for non-coniferous forests is not available.

6.3 Analysis and processing of national data

6.3.1 Estimation and forecasting

The weighted average growing stock per hectare has been used to estimate the growing stock. The area of coniferous forests in 2005 and 2010 has been linearly forecasted using its original data for 1990 and 2000 in Table 1.

Variable	Unit	1990	2000	2005	2010
Area of coniferous forests	"000" ha	1913	1512	1312	1111
Growing Stock per ha	m3/ha	123.78	123.78	123.78	123.78
Growing Stock in Coniferous forests	**million m3**	**237**	**187**	**162**	**138**
Area of non-coniferous forests	"000" ha	614	604	590	576
Growing Stock per ha	m3/ha	39	39	39	39
Growing Stock in non-coniferous forests	**million m3**	**24**	**24**	**23**	**22**
Total Growing Stock in forests	**million m3**	**261**	**211**	**185**	**160**

The 39 percent of coniferous forest is dominated by a mixture of Spruce and Fir trees. In addition, about 8 percent of coniferous forest is dominated by Fir and about 6 percent by Spruce. Therefore to estimate total relative dominance of Fir and Spruce in coniferous forests the 39 percent figure is broken down as 22 percent under Fir and 17 percent under Spruce following the ratio of 8:6. This leads to a total of 30 percent for Fir and 23 percent for Spruce. Due to lack of information, it is not possible to provide species-wise breakdown of non-coniferous growing stock.

Common Name	Scientific Name	Percent composition	Growing stock million m^3 (1990)	Growing Stock million m^3 (2000)
Fir	*Abies pindrow*	30	71.0	56.1
Kail	*Pinus wallichiana*	23	54.5	43.0
Spruce	*Picea smithiana*	23	54.5	43.0
Deodar	*Cedrus deodara*	18	42.6	33.7
Chir	*Pinus roxburghii*	4	9.5	7.5
Broad-leaved in Coniferous forests		2	4.7	3.7
Total Coniferous forests		100	236.8	187.2
Non-coniferous forests			23.9	23.6

6.4 Data for Table T6

Table 6a – Growing stock

FRA 2010 category	Volume (million cubic meters over bark)							
	Forest				Other wooded land			
	1990	2000	2005	2010	1990	2000	2005	2010
Total growing stock	261	211	185	160	n.a.	n.a.	n.a.	n.a.
... of which coniferous	237	187	162	138	n.a.	n.a.	n.a.	n.a.
... of which broadleaved	24	24	23	22	n.a.	n.a.	n.a.	n.a.
Growing stock of commercial species	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Table 6b – Growing stock of the 10 most common species

FRA 2010 category / Species name			Growing stock in forest (million cubic meters)		
Rank	**Scientific name**	**Common name**	**1990**	**2000**	**2005**
1st	*Abies pindrow*	Fir	71	56	49
2nd	*Pinus wallichiana*	Kail	54	43	38
3rd	*Picea smithiana*	Spruce	54	43	38
4th	*Cedrus deodara*	Deodar	43	34	30
5th	*Pinus roxburghii*	Chir	10	8	7
6th					
7th					
8th					
9th					
10th					
Remaining	Broad-leaved Species		29	27	24
TOTAL			**261**	**211**	**185**

Note: Rank refers to the order of importance in terms of growing stock, i.e. 1st is the species with the highest growing stock. Year 2000 is the reference year for defining the species list and the order of the species.

Table 6c – Specification of threshold values

Item	Value	Complementary information
Minimum diameter (cm) at breast height[1] of trees included in growing stock (X)	>4	
Minimum diameter (cm) at the top end of stem for calculation of growing stock (Y)	> 1	
Minimum diameter (cm) of branches included in growing stock (W)	5	
Volume refers to "above ground" (AG) or "above stump" (AS)	AG	

6.5 Comments to Table T6

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Total growing stock		
Growing stock of broadleaved / coniferous		
Growing stock of commercial species		
Growing stock composition		

Other general comments to the table
Generally, a declining trend in forest tree growing stock may be observed as a result of decrease in the forest cover in the country

[1] Diameter at breast height (DBH) refers to diameter over bark measured at a height of 1.30 m above ground level or 30 cm above buttresses if these are higher than 1 m.

7 Table T7 – Biomass stock

7.1 FRA 2010 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 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	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.

7.2 National data

7.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
FSMP. 1992. Forestry Sector Master Plan 1992. Reid, Collins and Associates, Canada, and Silviconsult Ltd. Sweden.	H	Biomass	1990	
GPG. 2003. Good Practice Guidance for Land Use, Land use Change and Forestry. IPCC.	H	Biomass	1990 and onwards	
FRA 2010 Guidelines				

7.2.2 Original data

The growing stock figures have been used form Table 6.

7.3 Analysis and processing of national data

Assumptions

(a) The weighted density has been assumed to be 0.7 as indicated in FSMP (1992).

(b) The Biomass expansion factor has been calculated as under using Sandra Brown formula {BEF = EXP(3.213-0.506*LN(Biomass/ha)}, which is mainly for Asian broad leaved forests.

Variable	Unit	1990	2000	2005	2010
Growing stock	million cubic meter	261	211	185	160
Weighted wood density		0.7	0.7	0.7	0.7
Stem biomass	**Million ton**	183	147	130	112
Forest Area	000 ha	2527	2116	1902	1687
Stem Biomass/ha	ton/ha	72	70	68	66
BEF		**2.85**	**2.9**	**2.94**	**2.98**

(c) The weighted root shoot ratios have been calculated for each of the reference years based on the relative percentage of conifers and non-coniferous forest using the default factors given in GPG, 2003 for coniferous and non-coniferous forests.

Variables	1990	2000	2005	2010
Default factor for Coniferous	0.32	0.32	0.32	0.32
% of coniferous	0.76	0.71	0.69	0.66
Default factor for non-coniferous	0.43	0.43	0.43	0.43
% of non-coniferous	0.24	0.29	0.31	0.34
Weighted Root Shoot Ratio	**0.347**	**0.351**	**0.354**	**0.357**

Biomass

Variable	Unit	1990	2000	2005	2010
Above Ground Biomass	**Million tonne**	**522**	**426**	**382**	**334**
Root Shoot ratio		0.347	0.351	0.354	0.357
Below Ground Biomass	**Million tonne**	**181**	**150**	**135**	**119**
Total Live biomass	**Million tonne**	**704**	**576**	**517**	**453**

7.4 Data for Table T7

FRA 2010 category	Biomass (million metric tonnes oven-dry weight)							
	Forest				Other wooded land			
	1990	2000	2005	2010	1990	2000	2005	2010
Above-ground biomass	522	426	382	334	n.a.	n.a.	n.a.	n.a.
Below-ground biomass	181	150	135	119	n.a.	n.a.	n.a.	n.a.
Dead wood	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
TOTAL	**n.a.**	**n.a.**	**n.a.**	**n.a.**	**n.a.**	**n.a.**	**n.a.**	**n.a.**

7.5 Comments to Table T7

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Above-ground biomass		
Below-ground biomass		
Dead wood		

Other general comments to the table

8 Table T8 – Carbon stock

8.1 FRA 2010 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 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	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 the minimum diameter for dead wood (e.g. 10 cm), lying dead in various states of decomposition above the mineral or organic soil.
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.

8.2 National data

8.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
FAO. 2008. Guidelines for Country Reporting to FRA 2005. Global Forest Resources Assessment 2010				Carbon conversion factor of 0.47

8.2.2 Original data

No original data on carbon were available, so the carbon conversion factor of 0.47 recommended in the FRA guidelines has been applied to the biomass as coming from table 7. Further the default factor of 2.1 tonnes/ha of carbon in forest litter has also been assumed for this table.

8.3 Data for Table T8

FRA 2010 Category	Carbon (Million metric tonnes)							
	Forest				Other wooded land			
	1990	2000	2005	2010	1990	2000	2005	2010
Carbon in above-ground biomass	245	200	180	157	n.a.	n.a.	n.a.	n.a.
Carbon in below-ground biomass	85	71	63	56	n.a.	n.a.	n.a.	n.a.
Sub-total: Living biomass	**330**	**271**	**243**	**213**	n.a.	n.a.	n.a.	n.a.
Carbon in dead wood	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Carbon in litter	5	4	4	4	n.a.	n.a.	n.a.	n.a.
Sub-total: Dead wood and litter	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Soil carbon	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
TOTAL	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Soil depth (cm) used for soil carbon estimates	

8.4 Comments to Table T8

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Carbon in above-ground biomass		A declining trend is evident in the above-ground carbon quantity because of shrinking forest resources in the country.
Carbon in below-ground biomass		
Carbon in dead wood		
Carbon in litter		
Soil carbon		

Other general comments to the table

9 Table T9 – Forest fires

9.1 FRA 2010 Categories and definitions

Category	Definition
Number of fires	Average number of vegetation fires per year in the country.
Area affected by fire	Average area affected by vegetation fires per year in the country.
Vegetation fire *(supplementary term)*	Any vegetation fire regardless of ignition source, damage or benefit.
Wildfire	Any unplanned and/or uncontrolled vegetation fire.
Planned fire	A vegetation fire regardless of ignition source that burns according to management objectives and requires limited or no suppression action.

9.2 National data

9.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
A preliminary Survey on Forest Fires in Pakistan By Muhammad Ayaz. PJF Vol53(1),2003	H	Forest Fire	1990, 2000	
FAO. 2000. Status of Forestry in Asia and the Pacific 2003-2004- Status. Change and Trends	H	Forest Fire	2000	

9.2.2 Classification and definitions

National class	Definition
Forest fires	The Forest Department of Pakistan defines the forest fires as follows: Any fire on forest land which is not used as a tool in forest production or management in accordance with an approved plan. The definition is totally compatible with FRA definition.

9.2.3 Original data

FRA-2005 Categories	Average annual area affected (1000 hectares)			
	Forests		Other wooded land	
	1990	2000	1990	2000
Disturbance by fire	49	41	NA	NA

9.3 Data for Table T9

Table 9a

FRA 2010 category	Annual average for 5-year period					
	1990		2000		2005	
	1000 hectares	number of fires	1000 hectares	number of fires	1000 hectares	number of fires
Total land area affected by fire	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
... of which on forest	49	n.a.	41	n.a.	n.a.	n.a.
... of which on other wooded land	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
... of which on other land	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Table 9b

FRA 2010 category	Proportion of forest area affected by fire (%)		
	1990	2000	2005
Wildfire	100	100	100
Planned fire	0	0	0

Note: The figures for the reporting years refer to the averages of annually affected areas for the 5-year periods 1988-1992, 1998-2002 and 2003-2007 respectively

9.4 Comments to Table T9

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Area affected by fire		
Number of fires		
Wildfire / planned fire		

Other general comments to the table

10 Table T10 – Other disturbances affecting forest health and vitality

10.1 FRA 2010 Categories and definitions

Term	Definition
Disturbance	Damage caused by any factor (biotic or abiotic) that adversely affects the vigour and productivity of the forest and which is not a direct result of human activities.
Invasive species	Species that are non-native to a particular ecosystem and whose introduction and spread cause, or are likely to cause, socio-cultural, economic or environmental harm or harm to human health.
Category	**Definition**
Disturbance by insects	Disturbance caused by insect pests.
Disturbance by diseases	Disturbance caused by diseases attributable to pathogens, such as bacteria, fungi, phytoplasma or virus.
Disturbance by other biotic agents	Disturbance caused by biotic agents other than insects or diseases, such as wildlife browsing, grazing, physical damage by animals, etc.
Disturbance caused by abiotic factors	Disturbances caused by abiotic factors, such as air pollution, snow, storm, drought, etc.

10.2 National data

10.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Expert estimate				

10.2.2 Classification and definitions

National class	Definition
Not available	

10.2.3 Original data

During 1990-2000, subtropical pine forests of N.W.F.P, Punjab, and Balochistan suffered from disease “Decay of Timber”. Similarly, in Balochistan, Juniper trees were attacked by the mistletoe . Shisham trees throughout the country are under attack by a complex disease “Die back”. During the year 2000, Blue Pine trees in Muree, Azad Kashmir and Galies were attacked by Blue Pine Beetles. The original data are presented directly in the reporting table.

10.3 Data for Table T10

Table 10a – Disturbances

FRA 2010 category	Affected forest area (1000 hectares)		
	1990	2000	2005
Disturbance by insects	5	10	n.a.
Disturbance by diseases	51	70	n.a.
Disturbance by other biotic agents	n.a.	n.a.	n.a.
Disturbance caused by abiotic factors	n.a.	n.a.	n.a.
Total area affected by disturbances	n.a.	n.a.	n.a.

Notes: The figures for the reporting years refer to the averages of annually affected areas for the 5-year periods 1988-1992, 1998-2002 and 2003-2007 respectively.

The total area affected by disturbances is not necessarily the sum of the individual disturbances as these may be overlapping.

Table 10b – Major outbreaks of insects and diseases affecting forest health and vitality

Description / name	Tree species or genera affected (scientific name)	Year(s) of latest outbreak	Area affected (1000 hectares)	If cyclic, approx. cycle (years)

Note: Area affected refers to the total area affected during the outbreak.

Table 10c – Area of forest affected by woody invasive species

Scientific name of woody invasive species	Forest area affected 2005 (1000 hectares)
Total forest area affected by woody invasive species	

Note: The total forest area affected by woody invasive species is not necessary the sum of the values above, as these may be overlapping.

10.4 Comments to Table T10

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Disturbance by insects		
Disturbance by diseases		
Disturbance by other biotic agents		
Disturbance caused by abiotic factors		
Major outbreaks		
Invasive species		

Other general comments to the table

11 Table T11 – Wood removals and value of removals

11.1 FRA 2010 Categories and definitions

Category	Definition
Industrial roundwood removals	The wood removed (volume of roundwood over bark) for production of goods and services other than energy production (woodfuel).
Woodfuel removals	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)	Additional comments
An overview of Forest Products Statistics in South and Southeast	H	Industrial and Fuelwood Production	2000	
Forestry Statistics Today and Tomorrow. 1961-1991--- 2010, FAO. 1993	H	Industrial and Fuelwood Production	1990	
Forestry Statistics of Pakistan.	H	Fuel wood and Timber Production	2000	
U.N. Timber Statistics--Pakistan	H	Value of Industrial wood	2000	U.N. Timber Statistics--Pakistan

11.2.2 Original data

Category	Removal in 000 m^3	
	1990	2000
Industrial wood removal	2434	2345
Woodfuel removal	24740	29315

The value of industrial wood has been calculated assuming average price of industrial wood as 1350 Rs/m^3 and 2400 Rs/m^3 during 1990 and year 2000 respectively. The fuel wood value has been calculated on the basis of basic density of 800kg/m3 and prices of Rs 40/40 kg and Rs 100/40 Kg for 1990 and 2000 respectively. This lead to the price of 800 Rs/m^3 and 2000 Rs/m^3 in 1990 and 2000.

Category	Value of Removal in Rs/m3	
	1990	2000
Industrial wood removal	1350	2400
Woodfuel removal	800	2000

11.3 Analysis and processing of national data

11.3.1 Estimation and forecasting

The removal forecast for 2005 has been developed by linear-extrapolation. The forecasted value rate of industrial removal (linear –extrapolation) for 2005 is 2925 Rs/m^3 and the forecasted price for woodfuel for 2005 is 2600 Rs/m^3.

11.4 Data for Table T11

FRA 2010 Category	Industrial roundwood removals			Woodfuel removals		
	1990	2000	2005	1990	2000	2005
Total volume (1000 m^3 o.b.)	2434	2345	2301	24740	29315	31603
... of which from forest						
Unit value (local currency / m^3 o.b.)	1350	2400	2925	800	2000	2600
Total value (1000 local currency)	3285900	5628000	6730425	19792000	58630000	82167800

Note: The figures for the reporting years refer to the averages of annually affected areas for the 5-year periods 1988-1992, 1998-2002 and 2003-2007 respectively.

	1990	2000	2005
Name of local currency	Pakistani rupee	Pakistani rupee	Pakistani rupee

11.5 Comments to Table T11

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Total volume of industrial roundwood removals		
Total volume of woodfuel removals	An important part of the woodfuel removals are likely coming from trees outside the forest.	
Unit value		
Total value		

Other general comments to the table
Major use of wood in Pakistan is as fuelwood. It is expected that harvesting of trees for fuelwood will continue in the coming years because of population pressure, poverty and unavailability of alternate sources of energy.

12 Table T12 – Non-wood forest products removals and value of removals

12.1 FRA 2010 Categories and definitions

Term	Definition
Non-wood forest product (NWFP)	Goods derived from forests that are tangible and physical objects of biological origin other than wood.
Value of NWFP removals	For the purpose of this table, value is defined as the market value at the site of collection or forest border.

NWFP categories

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. Wild meat
13. Raw material for medicine
14. Raw material for colorants
15. Other edible animal products
16. Other non-edible animal products

12.2 National data

12.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
FAO. 2003. Non-Wood Forest Products In The Near East: A Regional And National Overview. Authors. Amal Sabra and Sven Walter. http://www.fao.org/docrep/003/y1797e/y1797e15.htm	H	NWFP Removal and value	1990	
Latif. Et. al. 2003. Potential and Market Status of Mushrooms as Non-Timber Forest Products in Pakistan. Authors: Abdul Latif , Zabta Khan Shinwari and Shaheen Begum. Ethnobotany Project, University Town, Peshawar, Pakistan.	H	NWFP Removal and value	2000	

12.2.2 Classification and definitions

National class	Definition
	There is no national standard definition.

12.2.3 Original data

Category	Removal of NWFP (tonnes)	
	1990	2000
Food		
Morel (Morchella esculenta)	55	65
Seeds of Pinus gerardiana	21000	25,000
Walnut (Juglans regia)	18600	20000
Wild persimmon (Diospyros lotus)	80	75
Sub-total	39735	45140
Fodder	4,200,000	4,000,000
Medicines	568	600
Raw material for colorants and dyes.	40,000	42,000
Raw material for utensils, handicrafts & construction	42100	37,315
Ornamental plants	NA	NA
Exudates	4132	3500
Other plant products	250	240

It is difficult to collect the exact value of non-wood forest products produced and marketed in the country. Following are rough estimates only in USD as reported by the FRA 2005 report.

Category	Value in US dollars (000)	
	1990	2000
Food	10420	12000
Fodder	NA	NA
Raw Material for Medicine	8,300	9,000
Raw Material for Colorants	5,796	6,000
Raw Material for Utensil	5,040	4,000
Ornamental Plants	NA	NA
Exudates	500	400
Other plant products	NA	NA
Honey	240	270

12.3 Analysis and processing of national data

12.3.1 Estimation and forecasting

The figure for 2005 has been forecasted using linear-extrapolation.

Category	Quantity (t)	Value (000)USD
	2005	2005
Food		
Morel (Morchella esculenta)	70	
Seeds of Pinus gerardiana	27000	
Walnut (Juglans regia)	20700	
Wild persimmon (Diospyros lotus)	72.5	
Sub-total	47843	12790
Fodder	3,900,000	n.a.
Medicines	616	9350
Raw material for colorants and dyes.	43,000	6102
Raw material for utensils, handicrafts & construction	34,450	3480
Ornamental plants	NA	
Exudates	3184	350
Other plant products	235	n.a.

Since it is requested to give the value in local currency, the exchange rates of US dollar for 2005 are Pakistani of Rs.59.50 has been adopted (as given in T11 of the FRA 2005 report).

12.4 Data for Table T12

Rank	Name of product	Key species	Unit	NWFP removals 2005		NWFP category
				Quantity	Value (1000 local currency)	
1st	Morel	Morchella esculenta	t	70		1
2nd	Seeds	Pinus gerardiana	t	27000		1
3rd	Walnut	Juglans regia	t	20700		1
4th	Wild persimmon	Diospyros lotus	t	72.5	761005*	1
5th	Fodder		t	390000	n.a.	2
6th	Medicines		t	616	556325	
7th	Raw material for colorants and dyes.		t	43,000	363069	
8th	Raw material for utensils, handicrafts & construction		t	34,450	207060	
9th	Exudates		t	3184	20825	
10th						
All other plant products		Other plant products		235	n.a.	
All other animal products				238	86275	
TOTAL				**519496**	**n.a.**	

*value refers to the food category as a whole since breakdown of singular species value was not available.

	2005
Name of local currency	Pakistani rupee

12.5 Comments to Table T12

Variable / category	Comments related to data, definitions, etc.
10 most important products	
Other plant products	
Other animal products	
Value by product	
Total value	

Other general comments to the table
The main non-wood forest products (NWFP) of Pakistan are food products such as mushrooms (e.g. *Morchella esculenta, M. conica, M.anqusticipt*), honey, pine nuts (*Pinus gerardiana*), walnuts (*Juglans regia*), fruits (*Diospyros lotus, Capparis aphalla, Ziziphus spp., Viurnum nervosum, Morus alba*), vegetables (*Bauhinia variegata, Moringa oleifera, Dryopteris filix-mas*), condiments (*Punica granatum, Carum carvi*), medicinal plants (e.g. *Valeriana wallichii, Artemisia maritima, Hyoscyamus niger, Ephedra nebrodemsis, Digitalis purporea*) and essential oils (e.g. Eucalyptus oil, Peppermint oil, Menthol, Lemon oil and Orange oil). Other NWFP include exudates such as resins (*Pinus roxburghii*) and gums (palosa gum from Acacia modesta), tannins (*Acacia nilotica*), utensils and construction materials such as bhabar grass (*Eulaliopsis binata*) and fibres (*Nonnorrhops ritchieana*) miscellaneous products such as soap nut *(Sapindus mukorossi),* neem leaves and seeds (*Azadirachta indica*), walnut bark *(Juglans regia*) and animal products (Honey and silk cocoons). Mushrooms, pine nuts, some medicinal plants and resins constitute the main export products.

13 Table T13 – Employment

13.1 FRA 2010 Categories and definitions

Category	Definition
Full-time equivalents (FTE)	A measurement equal to one person working full-time during a specified reference period.
Employment	Includes all persons in paid employment or self-employment.
Paid employment	Persons who during a specified reference period performed some work for wage or salary in cash or in kind.
Self-employment	Persons who during a specified reference period performed some work for profit or family gain in cash or in kind (e.g. employers, own-account workers, members of producers' cooperatives, contributing family workers).

13.2 National data

13.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
FAO. 2003. An overview of forest products statistics in South and Southeast Asia. National Forestry Statistics-Pakistan http://www.fao.org/documents/show_cdr.asp?url_file=/DOCREP/005/AC778E/AC778E00.HTM)	M	Employment	1990-2000	
Economic Survey of Pakistan 2003	H	Primary Production	2000	
FAO. 2004. Trends and current status of the contribution of the forestry sector to national economies. Forest Products and Economic Division Working Paper FSFM/ACC/07.	M	Employment	2004	

13.2.2 Classification and definitions

National class	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.

13.2.3 Original data

FAO 2004 provides estimates of employment mainly on production. This is close to primary employment in production.

Category	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Employment in Forestry (000 person years)	31	29	30	24	21	17	23	25	26	26	29

It is assumed that employment related to management of protected areas may be additional 10 percent in roughly in proportion of the area under conservation to biodiversity (Table 3).

13.3 Analysis and processing of national data

1990: The average of figures of 1990, 1991 and 1992 has been taken
2000: The average of figures of 1998, 1999 and 2000 has been taken

13.4 Data for Table T13

FRA 2010 Category	Employment (1000 years FTE)		
	1990	2000	2005
Employment in primary production of goods	30	27	n.a.
...of which paid employment	30	27	n.a.
...of which self-employment	n.a.	n.a.	n.a.
Employment in management of protected areas	3	2.7	n.a.

13.5 Comments to Table T13

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Employment in primary production of goods		
Paid employment / self-employment		
Employment in management of protected areas		

Other general comments to the table

14 Table T14 – Policy and legal framework

14.1 FRA 2010 Categories and definitions

Term	Definition
Forest policy	A set of orientations and principles of actions adopted by public authorities in harmony with national socio-economic and environmental policies in a given country to guide future decisions in relation to the management, use and conservation of forest and tree resources for the benefit of society.
Forest policy statement	A document that describes the objectives, priorities and means for implementation of the forest policy.
National forest programme (nfp)	A generic expression that refers to a wide range of approaches towards forest policy formulation, planning and implementation at national and sub-national levels. The national forest programme provides a framework and guidance for country-driven forest sector development with participation of all stakeholders and in consistence with policies of other sectors and international policies.
Law (Act or Code) on forest	A set of rules enacted by the legislative authority of a country regulating the access, management, conservation and use of forest resources.

14.2 Data for Table T14

Indicate the existence of the following (2008)			
Forest policy statement with national scope		X	Yes
			No
If Yes above, provide:	Year of endorsement	1955	
	Reference to document	http://www.nfp-facility.org/media/14331/0/36/	
National forest programme (nfp)		X	Yes
			No
If Yes above, provide:	Name of nfp in country	National forest programme	
	Starting year		
	Current status		In formulation
		X	In implementation
			Under revision
			Process temporarily suspended
	Reference to document or web site	http://www.nfp-facility.org/media/14075/0/36/	
Law (Act or Code) on forest with national scope			Yes, specific forest law exists
			Yes, but rules on forests are incorporated in other (broader) legislation
		X	No, forest issues are not regulated by national legislation
If Yes above, provide:	Year of enactment		
	Year of latest amendment		
	Reference to document		

In case the responsibility for forest policy- and/or forest law-making is decentralized, please indicate the existence of the following and explain in the comments below the table how the responsibility for forest policy- and law-making is organized in your country.		
Sub-national forest policy statements	X	Yes
		No
If Yes above, indicate the number of regions/states/provinces with forest policy statements	n.a.	
Sub-national Laws (Acts or Codes) on forest	X	Yes
		No
If Yes above, indicate the number of regions/states/provinces with Laws on forests	n.a.	

14.3 Comments to Table T14

Variable / category	Comments related to data, definitions, etc.
Forest policy statement with national scope	
National forest programme (nfp)	The main forest policies at the national level have been formulated in 1955, 1991 and 2002.
Law (Act or Code) on forest with national scope	Forestry does not appear in the concurrent list of the constitution of Pakistan, as such it is a provincial subject.
Sub-national forest policy statements	
Sub-national Laws (Acts or Codes) on forest	According to notification No. S.R.O. 1328 (I) 73, the provinces have full power to adapt and amend previous federal laws on forestry and to make new ones and thus the list of forest-related federal and provincial statutes is long (see FAOLEX documents).

Other general comments to the table
At the provincial level, all provinces have a Forestry Department under a provincial Minister, with a secretary as the administrative head.

15 Table T15 – Institutional framework

15.1 FRA 2010 Categories and definitions

Term	Definition
Minister responsible for forest policy-making	Minister holding the main responsibility for forest issues and the formulation of the forest policy.
Head of Forestry	The Head of Forestry is the Government Officer responsible for implementing the mandate of the public administration related to forests.
Level of subordination	Number of administrative levels between the Head of Forestry and the Minister.
University degree	Qualification provided by University after a minimum of 3 years of post secondary education.

15.2 Data for Table T15

Table 15a – Institutions

FRA 2010 Category	2008	
Minister responsible for forest policy formulation : please provide full title	Ministry of Environment, Local Government and Rural Development	
Level of subordination of Head of Forestry within the Ministry		1st level subordination to Minister
		2nd level subordination to Minister
		3rd level subordination to Minister
		4th or lower level subordination to Minister
Other public forest agencies at national level		
Institution(s) responsible for forest law enforcement		

Table 15b – Human resources

FRA 2010 Category	Human resources within public forest institutions					
	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Total staff						
...of which with university degree or equivalent						

Notes:
1. Includes human resources within public forest institutions at sub-national level
2. Excludes people employed in State-owned enterprises, education and research, as well as temporary / seasonal workers.

15.3 Comments to Table T15

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Minister responsible for forest policy formulation	At the provincial level, all provinces have a Forestry Department under a provincial Minister, with a secretary as the administrative head. The **Chief conservators** who report to their respective provincial secretaries are the technical heads for all forestry matters.	
Level of subordination of Head of Forestry within the Ministry		
Other public forest agencies at national level		
Institution(s) responsible for forest law enforcement		
Human resources within public forest institutions		

Other general comments to the table

16 Table T16 – Education and research

No data are available for this reporting table.

17 Table T17 – Public revenue collection and expenditure

No data are available for this reporting table.