Forestry Department
Food and Agriculture Organization of the United Nations

GLOBAL FOREST RESOURCES ASSESSMENT

COUNTRY REPORTS

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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).

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Contents

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

1.2.2 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)
Statistical Yearbook of Forestry, Korea Forest Service. Korea.	H	Forest Other land	1990 2000
Cadastral Statistical Annual, Ministry of Government Administration and Home Affairs. Korea	H	Total area	2003

The National Forest Inventory (NFI) in Korea is carried out by the Division of Forest Inventory, Korea Forest Research Institute (KFRI) under Korea Forest Service (KFS). The NFI has been conducting on a regular base from 1972 approximately at 10-year intervals. Since the third inventory (1986-1992), about 3,500 sample plots have been systematically distributed all over the country and measured to investigate forest resources. The results of Province-wise inventory data are reported to the KFS at the end of the year, and KFS compiles and publishes the Statistical Yearbook of Forestry annually, based on the inventory data. The Yearbook covers all aspects of the status of Korean forestry, including national forestry statistics such as forest area, growing stock, timber production, forestry products, timber market etc. In addition, the Yearbook is updated every year using up-to-date data reported by local governments. The local government (Province) reports some kinds of forestry statistics annually to KFS, including change of forest area, disturbances, cutting, etc. The Statistical Yearbook of Forestry is the major source of national data for FRA 2005.

The categories and definitions of "Other wooded land" and "Other land with tree cover" are not applicable to national data. There is no national classification and data for "Other wooded land" and "Other land with tree cover" in national classification.

National statistics for "Total area of Korea" is different from year to year. It is considered that the reason of increasing total area is the tideland reclamation project in the western seashore of Korea.

1.2.2 Classification and definitions

National class	Definition
Forest	It consists of stocked forest land and un-stocked forest land. Stocked forest is land spanning more than 1 hectare with trees and a canopy cover of more than 30 percent. The number of young tree per ha is more than 1,200 in coniferous forest and 1,600 in broad-leaved forest, respectively. Un-stocked forest is land spanning more than 1 hectares with trees and a canopy cover of less than 30 percent, and includes non-stocked land, denuded land, reclaimed land, and miscellaneous forest land. The non-stocked forest lands are forested lands. The miscellaneous forest lands include rock, roads, grave/cemetery, nursery, orchard, military facilities etc.
Other land	All land that is not classified as "Forest", also includes "In Inland water bodies" which are rivers, lakes, ditches, marshes, dams, ponds, water reservoirs, etc

1.2.3 Original data

A. Landuse

National categories	Area in 000 ha	
	1990	2000
Forest		
Stocked	6,302	6,268
Un-stocked	174	154
Sub-Total	**6,476**	**6,422**
Other land	**3,451**	**3,524**
Total area	**9,927**	**9,946**

B. Detail Breakdown of Un-stocked Forest Lands

UN-stocked Forest	Area in 000 ha	
	1990	2000
Non-Stocked	47.00	32.30
Denuded	0.50	0.30
Reclaimed	21.80	0.02
Miscellaneous	105.10	121.20
Total	**174.40**	**153.82**

1.3 Analysis and processing of national data

Calibration

The figure of forest from the national data has been maintained and not subjected to calibration these are derived from reliable inventory data as well as up-to-date information. The area of inland water bodies has been adopted from FAOSTAT and changes due to this have been made in the area of "other land" to match the total and land area of the country with FAOSTAT.

Categories	**1990**	**2000**
Stocked Forest	6,302	6,268
Un-stocked Forest	174	154
Other land	3,397	3,451
Inland water bodies	53	53
Total land area	**9,926**	**9,926**

1.3.2 Estimation and forecasting

The 1990 and 2000 figures have been developed after reclassification. The figure for forests in 2005 has been forecasted by linear extrapolation with all adjustment in the "other land".

Categories	**Area in 000 ha**		
	1990	**2000**	**2005**
Forest	6371	6300	6265
Other land	3502	3573	3608
Inland water bodies	53	53	53
Total land area	**9926**	**9926**	**9926**

1.4 Reclassification into FRA 2005 classes

There is no matching classification and data for " Other wooded land" and "Other land with tree cover" in the country.

National Class	**Percentage allocation to FRA 2005 Categories**			
	Forest	**Other wooded land**	**Other land**	**Other land with tree cover**
Stocked Forest	100			
Un-stocked Forest				
Non-Stocked	100			
Denuded			100	
Reclaimed	100			
Miscellaneous			100	

(Note: "Non-Stocked" under un-stocked forests are forest with canopy cover between 10% and 30%. The miscellaneous forests under un-stocked forests include rock areas, roads, grave/cemetery, nursery, orchard, military facilities etc.)

1.5 Data for National reporting table T1

FRA 2005 Categories	**Area (1000 hectares)**		
	1990	**2000**	**2005**
Forest	6371	6300	6265
Other wooded land			
Other land	3,502	3573	3608
...of which with tree cover			
Inland water bodies	53	53	53
TOTAL	9926	9926	9926

1.6 Comments to National reporting table T1

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)
Statistical Yearbook of Forestry, Korea Forest Service	H	Ownership	1990 2000

2.2.2 Classification and definitions

National class	Definition
Private forest	Land owned by individuals, families etc, that is not included in Public forest and National forest.
Public forest	Land owned by the regional governments, Provinces or Counties.
National forest	Land owned by the national government or government-owned institutions or corporations.

Note: Korea consists of 9 Provinces, and County is sub-administrative district under the Province.

2.2.3 Original data

	1990		2000	
	Area (ha)	Percent	Area (ha)	Percent
National Forest	1,345,954	20.8	1,433,008	22.3
Public Forest	489,012	7.6	492,650	7.7
Private Forest	4,625,228	71.4	4,496,470	70.0
Un-surveyed	15,836	0.2		
Total	**6,476,030**	100	**6,422,128**	100.0

2.3 Analysis and processing of national data

2.3.1 Calibration

This step is not necessary.

2.3.2 Estimation and forecasting

The percentage of ownership has been applied to the forest area in Table T1 for maintaining consistency with Table T1.

FRA 2005 Categories	Area (1000 hectares)			
	Forest		Other wooded land	
	1990	2000	1990	2000
Private ownership	4613	4486		
Public ownership	1830	1921		
Other ownership	16	0		
TOTAL	**6459**	**6407**		

2.4 Reclassification into FRA 2005 classes

National categories	FRA Categories		
	Private ownership	Public ownership	Other ownership
National Forest		100%	
Public Forest		100%	
Private Forest	100%		
Un-surveyed			100%

2.5 Data for National reporting table T2

FRA 2005 Categories	Area (1000 hectares)			
	Forest		Other wooded land	
	1990	2000	1990	2000
Private ownership	4550	4411		
Public ownership	1805	1889		
Other ownership	16	0		
TOTAL	6,371	6,300		

2.6 Comments to National reporting table T2

The other ownership refers to un-surveyed areas.

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 of 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(s)
Statistical Yearbook of Forestry, Korea Forest Service	H	Designation	1990 2000

3.2.1 Classification and definitions

National class	Definition
Production forest	Forest reserved for mainly timber production. Forest management activities are allowed.
Non-production forest	Forest reserved for mainly public functions and services. Some kinds of management activities are legally and administratively restricted. Includes most of protection forests.

3.2.2 Original data

Function of forest	Area in ha	
	1990	**2000**
Production forest	**4,942,891**	**4,964,702**
Non-production forest	**1,517,303**	**1,457,426**
-Protected forest		
+Prevention of soil erosion and run-off	8,968	2,780
+Prevention of shifting sand dune	1,059	1,015
+Landslide prevention	178	54
+Watershed conservation	160,634	284,288
+Providing fish habitat	6,027	4,031
+Health	34	27
+Landscape	30,047	28,035
-Forest genetic resources	11,052	16,979
-National and provincial parks	455,600	457,100
-Recreational forest		127,012
-Other protection forest	843,704	536,105
Un-surveyed	**15,836**	**-**
Total forest area	**6,476,030**	**6,422,128**

3.3 Analysis and processing of national data

3.3.1 Calibration

This step is not necessary.

2.3.2 Estimation and forecasting

The reclassification (section 3.4) provides the following area and percentage under primary functions. The percentages for 2005 have been estimated through linear extrapolation.

Primary Functions	1990		2000		2005
	Area (000 ha)	Percentage	Area (000 ha)	Percentage	Percent
Production	4943	76.3	4965	77.3	77.8
Protection	1015	15.7	824	12.8	11.4
Conservation	473	7.3	478	7.4	7.5
Social Service	30	0.5	155	2.4	3.3
Unknown	16	0.2	0	0	0.0
Total	6,476	100	6,422	100	100

The above percentages have been applied to the “forest” area in Table 1 to generate following estimate of areas under different designations in 1990, 2000 and 2005.

Primary Functions	Area (000 ha) in 2005		
	1990	**2000**	**2005**
Production	4862	4870	4875
Protection	998	809	715
Conservation	465	469	471
Social Service	30	152	204
Unknown	16	0	0
Total	6,371	6,300	6,265

3.4 Reclassification into FRA 2005 classes

A. Primary Function

National Function of forest	Percentage allocation of a National class to a Primary Function class					
	Production	Protection of soil and water	Conservation of biodiversity	Social services	Multiple purpose	No or unknown function
Production forest	100%					
- Protected forest						
+ Prevention of soil erosion and run-off		100%				
+ Prevention of shifting sand dune		100%				
+Landslide prevention		100%				
+ Watershed conservation		100%				
+Providing fish habitat			100%			
+Health				100%		
+Landscape				100%		
- Forest genetic resources			100%			
- National and provincial parks			100%			
- Recreational forest				100%		
- Other protection forest		100%				
Un-surveyed						100%

B. Total Area with Function

Primary Function Areas	Percentage allocation to Total Area with Function					
	Production	Protection of soil and water	Conservation of biodiversity	Social services	Multiple purpose	No or unknown function
Production	100%					
Protection		100%	100%			
Conservation		100%	100%	100%		
Social Service				100%		
Unknown						

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	4,862	4,870	4,875	4,862	4,870	4,875
Protection of soil and water	998	809	715	1,463	1,278	1,186
Conservation of biodiversity	465	469	471	1,463	1,278	1,186
Social services	30	152	204	495	621	675
Multiple purpose				not appl.	not appl.	not appl.
No or unknown function	16	0	0	not appl.	not appl.	not appl.
Total – Forest	**6,371**	**6,300**	**6,265**	**not appl.**	**not appl.**	**not appl.**
Other wooded land						
Production						
Protection of soil and water						
Conservation of biodiversity						
Social services						
Multiple purpose				not appl.	not appl.	not appl.
No or unknown function				not appl.	not appl.	not appl.
Total – Other wooded land				**not appl.**	**not appl.**	**not appl.**

Comments to National reporting table T3

1. All forests in Korea are administratively and legally designated as Production or Non-production forest. The country does not consider it necessary to go further to classify “non-production forests”.

2. The country does not support development of data for “Total area with function” since it requires assessment / classification based on expert estimate. However, above figures have been provided to meet FRA 2005 demand only.

4 Table T4 – Characteristics of Forest and Other wooded land

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)	Year(s)
Statistical Yearbook of Forestry, Korea Forest Service	H	Designation	1990, 2000 and 2003

4.2.2 Classification and definitions

No clear definitions for plantation and natural forest are available. In general, plantation is a man-made forest by planting seedlings, and natural forest is a naturally regenerated forest.

4.2.3 Original data

National Classification	Area in ha		
	1990	2000	2003
Natural Forest			
Conifers	3,078,827	2,711,421	1,508,386
Non-conifers	1,389,215	1,665,550	1,550,960
Mixed	1,809,717	1,885,247	1,876,150
Bamboo	7,997	6,087	6,099
Un-stocked	174,438	153,823	144,409
Un-surveyed	15,836	-	-
Sub-Total	**6,476,030**	**6,422,128**	**5,086,004(79.4%)**
Plantation			
Conifers			1,211,339
Non-conifers			108,989
Sub-Total	**N/A**	**N/A**	**1,320,328(20.6%)**
Total	**6,476,030**	**6,422,128**	**6,406,332 (100%)**

Even though a lot of plantations have been established since 1970s, exact areas of existing plantation have not been investigated. But the Statistical Yearbook of Forestry 2004 reported that existing plantation was 1,320 thousand ha, based on the inventory data (1993-2003).

4.3 Analysis and processing of national data

4.3.1 Calibration

This step is not needed.

4.3.2 Estimation and forecasting

A. Plantations

Assuming that the 1320, 000 ha of plantations have been established since the first "10 year Forest Development plan" in 1973 leads to an annual plantation rate of about 44,000 ha. This leads to following estimate of cumulative area under the plantation in 1990, 2000 and 2003. The area of plantation in 2005 has been estimated by assuming that 44,000 ha of plantation has reforested during 2003 and 2005. Further, all plantations are considered as productive plantations.

Variable	**Area in 000 ha**			
	1990	**2000**	**2003**	**2005**
Cumulative Area of Plantations	748	1188	1320	1364

B. Modified Forests

The forests less plantations have been assumed to be modified forests specially when almost all of the protected areas fall under category IV and V of IUCN.

4.4 Reclassification into FRA 2005 classes

National Class	**FRA 2005 categories**				
	Primary	**Modified Natural**	**Semi natural**	**Product. Plant.**	**Prot. Plant.**
Plantations				100	
Forest less Plantations		100			

4.5 Data for National reporting table T4

	Area (1000 hectares)					
	Forest			**Other wooded land**		
FRA 2005 Categories	**1990**	**2000**	**2005**	**1990**	**2000**	**2005**
Primary	n.a.	n.a.	n.a.			
Modified natural	5,623	5,112	4,901			
Semi-natural	n.a.	n.a.	n.a.			
Productive plantation	748	1188	1364			
Protective plantation	n.a.	n.a.	n.a.			
TOTAL	**6,371**	**6,300**	**6,265**			

4.6 Comments to National reporting table T4

1. The national classification has no clear definitions on the forest characteristics. The country, therefore, does not have any published data to report on this table.

2. This table has been developed only for the purposes of reporting to FRA 2005 and it is mostly based on assumptions.

5 Table T5 – Growing stock

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

5.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)
Statistical Yearbook of Forestry, Korea Forest Service. Korea	H	Growing stock	1990, 2000 & 2003
Volume & weight, Korea Forest Service. Korea	H	Merchantable tree volume	

5.2.2 Classification and definitions

National class	Definition
Growing stock	Volume over bark of all living trees more than 6cm in diameter at breast height (or above buttress if these are higher). Includes the stem from ground level up to a tree top, and dose not include branches.
Merchantable tree volume	Part of volume over bark of all living trees more than 6cm in diameter at breast height (or above buttress if these are higher). Includes the stem from stump height(20cm) up to a top of 6cm in diameter, and dose not include branches.
Production forest	Forest reserved for mainly timber production. Forest management activities are allowed.
Non-production forest	Forest reserved for mainly public functions and services. Some kinds of management activities are legally and administratively restricted. Includes most of protection forests.
Commercial growing stock	Merchantable Growing stock in Production forest.
Non-commercial growing stock	Growing stock of Non-production forest.

5.2.3 Original data

A. Growing Stock

Forest type	Volume in million m^3		
	1990	2000	2003
Conifers	114	175	201
Hardwood	64	110	125
Mixed	70	122	142
Total	**248**	**407**	**468**

B. Growing stock in Production and Non-Production Forests

Classification	Volume in million m^3		
	1990	**2000**	**2003**
Growing stock of Production forest	**187**	**314**	**366**
Growing stock of Non-production forest	61	93	102
Total	**248**	**407**	**468**

5.3 Analysis and processing of national data

5.3.1 Calibration

This step is not needed.

5.3.2 Estimation and forecasting

A. Growing Stock

The growing stock for 2005 has been forecasted using long term trend between 1990 and 2003 rather than short term fluctuations between 2000 and 2003.

Forest type	Volume in million m^3		
	1990	**2000**	**2005**
Conifers	114	175	214
Hardwood	64	110	134
Mixed	70	122	153
Total Growing Stock	**248**	**407**	**502**

B. Commercial Growing Stock

The growing stock in production forest for 2005 has also been forecasted using long term trend between 1990 and 2003 rather than short term fluctuations between 2000 and 2003.

Variable	Volume in million m^3		
	1990	**2000**	**2005**
Growing Stock in Production Forests	187	314	394

The economic tree species are mostly pine and oak tree species, which are included in the ten most common tree species (Table T10) which constitute about 85.5% of the total growing stock. Further, only 80% of this volume is actually merchantable.

Forest type	Volume in million m^3		
	1990	**2000**	**2005**
Growing stock in Production Forests	187	314	394
Percentage of Economic species	0.855	0.855	0.855
Percentage of Merchantable volume	0.80	0.80	0.80
Commercial Growing Stock	**128**	**215**	**269**

5.4 - Reclassification into FRA 2005 classes

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	248	407	502			
Commercial growing stock	128	215	269			

Specification of country threshold values	Unit	Value	Complementary information
1. Minimum diameter at breast height of trees included in Growing stock (X)	Cm	6	
2. Minimum diameter at the top end of stem (Y) for calculation of Growing stock	Cm	-	
3. Minimum diameter of branches included in Growing stock (W)	Cm	-	
4. Minimum diameter at breast height of trees in Commercial growing stock (Z)	Cm	6	
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

The commercial growing stock is subject to change, because FRA classification and definition were applied without considering national definition, if any. Moreover, it is assumed that the ten most common tree species are potentially feasible in domestic timber market, based on the expert knowledge.

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

6.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)
Statistical Yearbook of Forestry, Korea Forest Service. Korea.	H	Growing stock	1990 2000
Wood properties and uses of major tree species growing in Korea, Korea Forest Research Institute. Korea	M	Basic density Pinus for Conifers and Quercus for Hardwood	1994
Analysis of studies on production of forest biomass in Korea, Journal of Korea Forestry Energy 8(2).	M	Biomass Expansion Factor, Root-Shoot Ratio	1988
GPG, 2003. Good Practise Guidance for Land-use, Land-use Change and Forestry. IPCC.	H	Dead to Live Ratio	All

6.2.2 Classification and definitions

National class	Definition
Above-ground biomass	All living biomass above the soil including stem, stump, branches, bark
Below-ground biomass	All living biomass of live roots. No data on threshold value for fine root
Dead wood biomass	No definitions

6.2.3 Original data

A. National factors of BD, BEF and Root Shoot Ratio

Forest type	Basic density	BEF	Root-Shoot Ratio
Conifers	0.470	1.290	0.280
Hardwoods	0.800	1.220	0.410
Mixed	0.635	1.255	0.345

Note: Values for "Mixed" are the average of those for conifers and hardwoods

Basic density, biomass expansion factors and root-shoot ratio used in this table are the results from quite limited number of previous researches. These national factors will be updated in the future through new research projects.

6.3 Analysis and processing of national data

6.3.1 Calibration

This step is not needed.

6.3.2 Estimation and forecasting

A. Live Biomass of Conifers

Variables	**Forest**		
	1990	2000	2005
Total Growing Stock (million m3)	114	175	214
Wood Density	0.47	0.47	0.47
Stem biomass (million tonnes)	54	82	101
Biomass Expansion Factor	1.29	1.29	1.29
Above Ground Biomass - (million tonnes)	69	106	130
Root Shoot Ratio	0.28	0.28	0.28
Below Ground Biomass - (million tonnes)	19	30	36

B. Live Biomass of Broadleaved

Variables	**Forest**		
	1990	**2000**	**2005**
Total Growing Stock (million m3)	64	110	134
Wood Density	0.8	0.8	0.8
Stem biomass (million tonnes)	51	88	108
Biomass Expansion Factor	1.22	1.22	1.22
Above Ground Biomass - (million tonnes)	62	107	131
Root Shoot Ratio	0.41	0.41	0.41
Below Ground Biomass - (million tonnes)	26	44	54

B. Live Biomass of Mixed

Variables	**Forest**		
	1990	**2000**	**2005**
Total Growing Stock (million m3)	70	122	153
Weighted Density	0.635	0.635	0.635
Stem biomass (million tonnes)	44	77	97
Biomass Expansion Factor	1.255	1.255	1.255
Above Ground Biomass - (million tonnes)	56	97	122
Root Shoot Ratio	0.345	0.345	0.345
Below Ground Biomass - (million tonnes)	19	34	42

C. Total Live Biomass

Variables	**Forest**		
	1990	**2000**	**2005**
Above Ground Biomass - (million tonnes)	187	311	383
Below Ground Biomass - (million tonnes)	64	107	132
Total Live Biomass	**252**	**418**	**515**

D. Total Dead Wood Biomass

Deadwood Biomass has been estimated assuming the dead to live ratio of 0.11 from GPG (2003).

Variables	**Forest**		
	1990	**2000**	**2005**
Total Live Biomass	252	418	515
Dead to Live ratio	0.11	0.11	0.11
Total Dead Wood Biomass	**28**	**46**	**57**

6.4 Reclassification into FRA 2005 classes

This step is not needed.

6.5 Data for National reporting table T6

FRA 2005 Categories	**Biomass (million metric tonnes oven-dry weight)**					
	Forest			**Other wooded land**		
	1990	**2000**	**2005**	**1990**	**2000**	**2005**
Above-ground biomass	187	311	383			
Below-ground biomass	64	107	132			
Dead wood biomass	28	46	57			
TOTAL	**279**	**464**	**572**			

6.6 Comments to National reporting table T6

7 Table T7 – Carbon stock

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

7.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)
Statistical Yearbook of Forestry, Korea Forest Service. Korea.	H	Growing stock	1990 2000
GPG, 2003. Good Practice Guidance for Land-use, Land-use Change and Forestry. IPCC.	H	Carbon conversion factor	1996

7.2.2 Classification and definitions

National class	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. No data on threshold value for fine root

7.2.3 Original data

The GPG (2003) biomass to carbon conversion factor of 0.5 has been adopted of this table.

7.3 Analysis and processing of national data

7.3.1 Calibration

This step is not needed.

7.3.2 Estimation and forecasting

The carbon content in biomass stocks has been calculated suing the GPG(200) default factor of 0.5.

FRA2005 categories	1990	2000	2005
Carbon in above-ground biomass	93.68	155.34	191.55
Carbon in below-ground biomass	32.10	53.63	66.12
Total : Carbon in living biomass	**125.78**	**208.97**	**257.67**
Carbon in Deadwood Biomass	**14**	**23**	**28**

7.4 Reclassification into FRA 2005 classes

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	94	155	192			
Carbon in below-ground biomass	32	54	66			
Sub-total: Carbon in living biomass	**126**	**209**	**258**			
Carbon in dead wood	14	23	28			
Carbon in litter	0	0	0			
Sub-total: Carbon in dead wood and litter	**14**	**23**	**28**			
Soil carbon to a depth of _____ cm						
TOTAL CARBON	**140**	**232**	**286**			

7.6 Comments to National reporting table T7

8 Table T8 – Disturbances affecting health and vitality

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)
Statistical Yearbook of Forestry, Korea Forest Service. Korea	H	All variables	1988-2003

8.2.2 Classification and definitions

National class	Definition
Damages by forest fire	Damaged or burned forest land by forest fire.
Damages by insect pests	Damaged forest by insect pests such as pine gall midge, black pine bast scale, pine wood nematode, pine caterpillar, fall webworm, Japanese alder leaf beetle, others
Damages by diseases	Damaged forest by diseases such as white pine blister rust, others
Others	Damages from illegal forest activities- steal felling, unlicensed cutting, unlawful conversion of forest to other uses, etc.

8.2.3 Original data

There are disturbances caused by other natural process like snow fall, wind storm and flood in Korea but statistics is not available on such disturbances. Others in national classification is mainly related to disturbance caused by illegal activities in forests, which are not included in this table of FRA 2005.

Disturbance by diseases in Korea has been quite rare since 1997. No data are available these days.

Type of Disturbance	Annual Area Damaged (000 ha)							
	1988	1989	1990	1991	1992	1993	1994	1995
Forest Fire	0.878	1.652	0.175	0.429	0.640	1.752	0.780	1.013
Insects	459.54	417.519	384.485	366.013	357.378	358.813	353.886	371.288
Diseases	3.437	3.088	1.926	0.769	1.277	0.730	0.612	0.353
Others								

Type of Disturbance	Annual Area Damaged (000 ha)							
	1996	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Forest Fire	5.367	2.330	1.014	0.473	25.953	0.963	4.467	0.133
Insects	369.796	377.765	371.187	361.720	339.988	336.528	292.266	254.190
Diseases	0.351							
Others								

8.3 Analysis and processing of national data

8.3.1 Calibration

This step is not needed.

8.3.2 Estimation and forecasting

Five year averages have been calculated for reporting data for 1990 and 2000.

Type of Disturbance	**Average annual area affected (1000 ha.)**	
	1990	**2000**
Forest Fire	0.8	6.6
Insects	397	340
Diseases	2	0
Others		
Total	**399.8**	**346.91**

8.4 Reclassification into FRA 2005 classes

This step is not needed.

8.5 Data for National reporting table T8

FRA-2005 Categories	**Average annual area affected (1000 ha.)**			
	Forests		**Other wooded land**	
	1990	**2000**	**1990**	**2000**
Disturbance by fire	1	7	-	-
Disturbance by insects	397	340	-	-
Disturbance by diseases	2	-	-	-
Other disturbance			-	-

8.6 Comments to National reporting table T8

9 Table T9 – Diversity of tree species

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

9.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)
Statistical Yearbook of Forestry, Korea Forest Service. Korea	H	Threatened species	2003
Vascular plants and their uses in Korea, Bulletin of the Kwanak Arboretum No.1	M	Native species	1976
Silvicultural Technique, Korea Forest Service	M	Native species	1981
IUCN. 2004. Red List of Threatened Species. Gland, Switzerland: The World Conservation Union.	H	Threatened species	2004

9.2.2 Classification and definitions

No national definitions or classifications relevant to this table are available.

9.2.3 Original data

- Native species

There are not many research papers which investigate how many tree native species grow in Korea. Moreover, the definition of "tree" is not clear, because the threshold of potential tree height is not defined.

The "Silvicultural Technique, Korea Forest Service(1981)" informs that 1,049 native forest tree species grow in Korea. Another reference, "Vascular plants and their uses in Korea, Bulletin of the Kwanak Arboretum No.1(1976)", native plants are 4,158 species, and introduced plants are 438 species. It also reported that the number of woody plants is 1,323 species, of which 1178 species are native, and 145 species are exotic or introduced.

- Endangered species

National classification of endangered species in Korea is expressed as “Rare and endangered plant species” which includes about 240 plant species, where as the 2005 website for Red list does not indicate any species as threatened species.

9.3 Data for National reporting table T9

FRA 2005 Categories	**Number of species (year 2000)**
Native tree species	1,049
Critically endangered tree species	0
Endangered tree species	0
Vulnerable tree species	0

9.4 Comments to National reporting table T9

1. There are not many research papers which investigate how many tree native species grow in Korea. Moreover, the definition of “tree” is not clear, because the threshold of potential tree height is not defined.

The “Silvicultural Technique, Korea Forest Service(1981)” informs that 1,049 native forest tree species grow in Korea. Another reference, “Vascular plants and their uses in Korea, Bulletin of the Kwanak Arboretum No.1(1976)”, native plants are 4,158 species, and introduced plants are 438 species. It also reported that the number of woody plants is 1,323 species, of which 1178 species are native, and 145 species are exotic or introduced.

2. National classification of endangered species in Korea is expressed as “Rare and endangered plant species” which includes about 240 plant species where as the IUCN 2005 website for Red list does not indicate any species as threatened species.

10 Table T10 – Growing stock composition

10.1 FRA 2005 Categories and definitions

List of species names (scientific and common names) of the ten most common species.

No.	Scientific name	Common name
1	*Pinus densiflora S. et Z.*	Red pine
2	*Larix leptolepis (S. et Z.) Gordon*	Japanese larch
3	*Quercus mongolica Fisch.*	Mongolian oak
4	*Pinus rigida Mill.*	Pitch pine
5	*Quercus acutissima Carruth.*	Oriental chestnut oak
6	*Quercus variabilis Bl.*	Oriental cork oak
7	*Quercus serrata Thunb.*	Serrate oak
8	*Pinus koraiensis S. et Z.*	Korean white pine
9	*Carpinus laxiflora Bl.*	Loose flower hornbeam
10	*Quercus aliena Bl.*	Oriental white oak.

10.2 National data

10.2.1 Data sources

References to sources of information	**Quality (H/M/L)**	**Variable(s)**	**Year(s)**
Statistical Yearbook of Forestry, Korea Forest Service	H	Growing stock	1990, 2000 2003, 2004
Hardwood Forest Inventory Report, Forestry Research Institute,	H	Proportion of hardwood	1996

10.2.2 Classification and definitions

No national definitions relevant to this table are available.

10.2.3 Original data

In the National Forest Inventory, all data are not analyzed on the basis of tree species but forest types like coniferous, broadleaved and mixed forests. Only the coniferous forests are further classified in details, because most of them can be identified with ease both in the field and on the aerial photos. On the contrary, it is difficult to classify and identify all the broadleaved tree species even in the field survey.

In 1993-1995, Hardwood Forest Inventory, apart from the NFI, was carried out to investigate the status of the broadleaved tree species. It revealed very important information on the hardwood forest resources, such as species composition, distribution, growing stock, etc.

Under the strong-drive policy, a lot of plantation has been established since 1970s. Reportedly it accounts for 1/3 of the total forest land, but no official statistics has been available until the Yearbook of 2004 reported the existing plantation area.

In spite of different survey year, these data sources are used in compiling this table. Further Most of coniferous forests are regarded as plantations except natural red pine forests.

A. Growing stock proportion by species in coniferous forest

Coniferous tree species	Proportion(%)
Red pine	61.9%
Korean white pine	4.3%
Japanese larch	18.0%
Pitch pine	14.2%
Other conifers	1.6%

B. Growing stock proportion by species in broadleaved forest

Broadleaved tree species	Proportion(%)
Oriental Chestnut Oak	15.5%
Mongolian Oak	20.3%
Oriental Cork Oak	14.0%
Serrate Oak	13.2%
Black Locust	3.6%
Oriental White Oak.	3.7%
Sargent Cherry	3.4%
Loose flower Hornbeam	4.0%
Other hardwoods	22.3%

(Source: Hardwood Forest Inventory 1996).

C. Growing stock by forest type in 1990 and 2000

Forest type	Growing stock (million cubic meters)	
	1990	2000
Conifers	114	175
Hardwood	64	110
Mixed	40	122
Total	218	407

D. Growing stock composition of mixed forests

According to the Hardwood Forest Inventory 1996, the ratio of coniferous forests and broadleaved forest is following.

- Coniferous forest 35%
- Broadleaved forest 65%

10.3 Analysis and processing of national data

10.3.1 Calibration

This step is not needed.

10.3.2 Estimation and Forecasting

A. Growing Stock

The proportion of the mixed forest (Hardwood Inventory, 1996) is applied to the growing stock in 1990 and 2000 to restate it in terms of coniferous and broadleaved forests.

Forest type	Growing stock (million m^3)	
	1990	**2000**
Conifers	138.5	217.7
Hardwood	109.5	189.3
Total	**248**	**407**

B. Breakdown of Growing Stock by Species

Forest type/Species	Proportion	1990	2000
Conifers	**(100%)**	**138.5**	**217.7**
-Red pine	61.9%	85.7	134.8
-Korean white pine	4.3%	6.0	9.4
-Japanese larch	18.0%	24.9	39.2
-Pitch pine	14.2%	19.7	30.9
-Other conifer	1.6%	2.2	3.5
Hardwoods	**(100%)**	**109.5**	**189.3**
-Oriental Chestnut Oak	15.5%	17.0	29.3
-Mongolian Oak	20.3%	22.2	38.4
-Oriental Cork Oak	14.0%	15.3	26.5
-Serrate Oak	13.2%	14.5	25.0
-Black Locust	3.6%	3.9	6.8
-Oriental White Oak.	3.7%	4.1	7.0
-Sargent Cherry	3.4%	3.7	6.4
-Loose flower Hornbeam	4.0%	4.4	7.6
-Other hardwoods	22.3%	24.4	42.2

C. Growing stock of the ten most common species

No.	Species	1990	2000
1	Red pine	85.7	134.8
2	Japanese larch	24.9	39.2
3	Mongolian Oak	22.2	38.4
4	Pitch pine	19.7	30.9
5	Oriental Chestnut Oak	17.0	29.3
6	Oriental Cork Oak	15.3	26.5
7	Serrate Oak	14.5	25.0
8	Korean white pine	6.0	9.4
9	Loose flower Hornbeam	4.4	7.6
10	Oriental White Oak.	4.1	7.0
	Remainder	34.3	58.9
	Total	248.0	407.0

10.4 Data for National reporting table T10

FRA 2005 Categories / Species name		**Growing Stock in Forests (million cubic meters)**	
Scientific name	**Common name**	**1990**	**2000**
Pinus densiflora S. et Z.	Red pine	85.7	134.8
Larix leptolepis (S. et Z.) Gordon	Japanese larch	24.9	39.2
Quercus mongolica Fisch.	Mongolian oak	22.2	38.4
Pinus rigida Mill.	Pitch pine	19.7	30.9
Quercus acutissima Carruth.	Oriental chestnut oak	17.0	29.3
Quercus variabilis Bl.	Oriental cork oak	15.3	26.5
Quercus serrata Thunb.	Serrate oak	14.5	25.0
Pinus koraiensis S. et Z.	Korean white pine	6.0	9.4
Carpinus laxiflora Bl.	Loose flower hornbeam	4.4	7.6
Quercus aliena Bl.	Oriental white oak.	4.1	7.0
Remainder of species		34.3	58.9
TOTAL		248.0	407.0

10.5 Comments to National reporting table T10

Final data for Table10 are subject to change in the future because the base year of the data sources are different form the reference year. The above results are only estimate based on the existing data sources available at this moment.

11 Table T11 – 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)
Statistical Yearbook of Forestry, Korea Forest Service. Korea.	L	Wood Removal	1988-1992 1998-2002

11.2.2 Classification and definitions

No national definitions and classifications relevant to this table are available.

11.2.3 Original data

Year	Wood Removal in m^3 (Overbark)	
	Industrial wood removal	Fuel wood removal
1988	1,246,000	2,767,143
1989	1,227,000	2,759,876
1990	1,138,000	2,733,618
1991	1,286,000	2,662,479
1992	1,123,000	2,610,825
1998	1,428,000	2,438,248
1999	1,694,000	2,444,075
2000	1,592,000	2,449,237
2001	1,533,000	2,453,806
2002	1,605,000	2,457,638

11.3 Analysis and processing of national data

11.3.1 Calibration

This step is not needed.

11.3.2 Estimation and forecasting

A. Fiver year averages for 1990 and 2000

Following five year averages have been developed for reporting for the years 1990 and 2000.

Categories	Wood removal in 000 m^3	
	1990	2000
Industrial wood removal	1,204	1,570
Wood Fuel removal	2,707	2,449

B. Forecasting for 2005

The figures for 2005 have been forecasted using linear extrapolation method.

Categories	Wood removal (000 m^3)
	2005
Industrial wood removal	1,754
Fuel wood removal	2,320

11.4 Reclassification into FRA 2005 classes

This step is not needed.

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	1204	1570	1754			
Woodfuel	2707	2449	2320			
TOTAL for Country	3911	4019	4074			

11.6 Comments to National reporting table T11

About 90% of domestic timber consumption rely on the imported timber, while the main use of the domestic timber is for chip and pulp.

12 Table T12 – Value of wood removal

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(s)
Statistical Yearbook of Forestry, Korea Forest Service. Korea.	L	Value of Wood Removal	1990 2000

12.2.2 Classification and definitions

No national definitions and classifications relevant to this table are available.

12.2.3 Original data

Variable	1990	2000
Price of Industrial wood (won/m3)	79,500	103,625
Price of fuelwood (Assumed 5% of Industrial)	3,975	5,181
Exchange rate	716.4	1264.5
Price of Industrial wood in USD	111.0	81.9
Price of Fuelwood in USD	5.5	4.1

12.3 Analysis and processing of national data

12.3.1 Calibration

This step is not needed.

12.3.2 Estimation and forecasting

A. Price for 2005

The price for 2005 has been forecasted using linear extrapolation of prices in 1990 and 2000.

Variable	2005
Price of Industrial wood (won/m3)	115688
Price of fuelwood (Assumed 5% of Industrial)	5,784
Exchange rate	1001.0
Price of Industrial wood in USD	115.6
Price of Fuelwood in USD	5.8

B. Value of Wood removal

	Value of removal (1000 USD)		
Value of Wood removal	**1990**	**2000**	**2005**
Industrial wood	133609	128693	202667
Wood fuel	15019	10033	13404

12.4 Reclassification into FRA 2005 classes

This step is not needed.

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	133609	128693	202667			
Woodfuel	15019	10033	13404			
TOTAL for Country	148628	138726	216071			

12.6 Comments to National reporting table T12

13 Table T13 – Non-wood forest product removal

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(s)**
Statistical Yearbook of Forestry, Korea Forest Service. Korea.	M	NWFP Removal	1988-1992 1998-2002

13.2.2 Classification and definitions

No national definitions relevant to this table are available.

13.2.3 Original data

The national data for forest products are available in the Statistical Year book but wood and non-wood products are not clearly classified. Some of NWFP are reported in different units, which are difficult to convert into mass. Moreover, definitions for some type of NWFP are not clear to reclassify them into FRA categories. In forestry statistics, there are some other NWFP such as oak leaves, smilax leaves, kudzu vine, Japanese eurya, saw dust, material for landscape, soil and stone, etc. whose data are reported in terms of volume instead of mass. It is not possible to convert this data into mass because no conversion factors are available. Therefore, they are excluded in this report.

There are no national data for animal products/raw material.

A. National Data From 1988 to 1992

Type of NWFP	Unit	1988	1989	1990	1991	1992
Manure	MT	13,800,316	12,239,314	10,084,064	7,754,685	6,922,950
Forage-fodder	MT	5,263,816	3,550,422	2,546,608	1,935,341	1,613,303
Nuts and Fruits	MT	88,197	89,957	95,801	102,005	117,549
Mushroom	MT	2,056	2,903	2,997	2,424	3,647
Fiber material	MT	427	452	301	352	331
Resin	MT	366	505	890	375	1,313
Tannin	MT	49	99	83	55	19
Medicinal plants	MT	1,567	1,561	1,528	1,488	1,671
Oak cork	MT	125	115	64	71	58
Bamboo shoot	MT	1,327	1,250	1,634	1,699	1,651
Wild vegetable	MT	4,576	3,989	9,534	12,530	16,330
Sap	MT	n.a.	n.a.	n.a.	n.a.	n.a.
Wood vinegar	MT	n.a.	n.a.	n.a.	n.a.	n.a.

B. National Data From 1998 to 2002

Type of NWFP	Unit	1998	1999	2000	2001	2002
Manure	MT	3,266,077	3,244,081	1,736,807	1,979,350	1,846,755
Forage-fodder	MT	832,042	731,623	596,976	506,681	517,596
Nuts and Fruits	MT	143,511	145,521	161,341	159,422	139,287
Mushroom	MT	4,527	5,361	20,660	21,251	24,688
Fiber material	MT	267	326	263	235	224
Resin	MT	2.3	2.0	1.8	1.8	1.7
Tannin	MT					
Medicinal plants	MT	1,975	1,174	1,157	1,295	1,113
Oak cork	MT					
Bamboo shoot	MT	755	718	678	523	578
Wild vegetable	MT	23,825	26,972	25,591	25,096	27,715
Sap	MT	2,432	3,337	3,386	3,129	3,218
Wood vinegar	MT	1,334	1,816	2,523	6,144	2,964

C. Five year Averaged Data

The above data has been averaged for five years around 1990 and 2000.

Type of NWFP	Unit	1990	2000
Manure	MT	10,160,266	2,414,614
Forage-fodder	MT	2,981,898	636,984
Nuts and Fruits	MT	98,702	149,816
Mushroom	MT	2,805	15,297
Fiber material	MT	373	263
Resin	MT	690	2
Tannin	MT	61	
Medicinal plants	MT	1,563	1,343
Oak cork	MT	87	
Bamboo shoot	MT	1,512	650
Wild vegetable	MT	9,392	25,840
Sap	MT	n.a.	3,100
Wood vinegar	MT	n.a.	2,956
Total		13,257,349	3,250,865

The above national groups represent the following NWFP.

National Group	NWFP
Nut and Fruits	Chesnut, walnut, jujube, ginko, persimon, raspberry, wild grapes, Chinese pepper, torreya nut
Wild Vegetables	Fernbrake, Chinese bellflower, codonopsis lanceolata, angelica, osmund. Bamboo shoot, etc.
Sap	painted maple, costata birch, white birch etc.
Medicinal Plants	cornelian cherry fruit, cultivated mountain Ginseng, solomon's seal, etc.
Fibre	Paper mulberry, edzeworthia papyrifera, etc.
Mushroom	Pine mushroom, oak mushroom, black fungus, oyster mushroom, etc.
Resin	Oriental lacquer, yellow lacquer, pine-root oil, etc.
Tanin	Chinese galls, alder cones,

13.3 Analysis and processing of national data

13.3.1 Calibration

This step is not needed

13.3.2 Estimation and forecasting

The 1990 and 2000 figures have been developed after reclassification (section 13.4) of the five year averaged data. The forecasted figures for 2005 have been developed by linear extrapolation of 1990 and 2000 figures.

FRA categories	Unit	1990	2000	2005
1. Food	MT	112411	191603	231199
2. Fodder	MT	2981898	636984	Not appl.
3. Raw material for medicine and aromatic production	MT	1563	1343	1233
4. Raw material for colorants and dyes	MT	751	2	i.d.
5. Raw material for utensils, handicrafts and construction	MT	87	i.d.	i.d.
6. Ornamental plants	MT	i.d.	i.d.	
7. Exudates	MT	i.d.	6056	i.d.
8. Other plant products	MT	10160639	2414877	Not appl.

13.4 Reclassification into FRA 2005 classes

National Categories NWFP	Percent allocation to FRA2005 categories-Plant products/raw material							
	1	2	3	4	5	6	7	8
Manure								100
Forage-fodder		100						
Nuts and Fruits	100							
Mushroom	100							
Fiber material								100
Resin				100				
Tannin				100				
Medicinal plants			100					
Oak cork					100			
Bamboo shoot	100							
Wild vegetable	100							
Sap							100	
Wood vinegar							100	

13.5 Data for National reporting table T13

FRA 2005 Categories	Scale factor	Unit	NWFP removal		
			1990	2000	2005
Plant products / raw material					
1. Food		MT	112,411	191,603	231,199
2. Fodder		MT	2,981,898	636,984	Not appl.
3. Raw material for medicine and aromatic products		MT	1,563	1,343	1,233
4. Raw material for colorants and dyes		MT	751	2	i.d.
5. Raw material for utensils, handicrafts & construction		MT	87	i.d.	i.d.
6. Ornamental plants		MT	i.d.	i.d.	i.d.
7. Exudates		MT	i.d.	6,056	i.d.
8. Other plant products		MT	10,160,639	2,414,877	Not appl.
Animal products / raw material			n.a.	n.a.	n.a.
9. Living animals			n.a.	n.a.	n.a.
10. Hides, skins and trophies			n.a.	n.a.	n.a.
11. Wild honey and bee-wax			n.a.	n.a.	n.a.
12. Bush meat			n.a.	n.a.	n.a.
13. Raw material for medicine			n.a.	n.a.	n.a.
14. Raw material for colorants			n.a.	n.a.	n.a.
15. Other edible animal products			n.a.	n.a.	n.a.
16. Other non-edible animal products			n.a.	n.a.	n.a.

13.6 Comments to National reporting table T13

1. The national data is insufficient to estimate or present the total quantity of NWFP removal.

2. The national data for forest products are available in the Statistical Year book but wood and non-wood products are not clearly classified. Some of NWFP are reported in different units, which are difficult to convert into mass. Moreover, definitions for some type of NWFP are not clear to reclassify them into FRA categories. In forestry statistics, there are some other NWFP such as oak leaves, smilax leaves, kudzu vine, Japanese eurya, saw dust, material for landscape, soil and stone, etc. whose data are reported in terms of volume instead of mass. It is not possible to convert this data into mass because no conversion factors are available. Therefore, they are excluded in this report.

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

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(s)**
Statistical Yearbook of Forestry, Korea Forest Service. Korea.	M	Value of NWFP Removal	1988-1992 1998-2002

14.2.2 Classification and definitions

No national definitions relevant to this table are available.

14.2.3 Original data

NWFP	**Value in million Won**				
	1988	**1989**	**1990**	**1991**	**1992**
Manure	267,175	263,880	238,488	223,878	239,880
Forage-fodder	101,907	76,547	60,227	55,873	55,901
Nuts and Fruits	116,239	134,474	150,358	182,801	192,272
Mushroom	50,744	59,928	64,419	70,295	99,633
Fiber material	514	669	696	1,166	1,188
Resin	374	1,951	862	843	1,912
Tannin	68	141	157	140	59
Medicinal plants	7,836	7,561	10,382	12,852	14,369
Oak cork	37	34	19	25	27
Bamboo shoot	759	1,001	486	701	839
Wild vegetable	7,322	8,220	25,252	36,149	47,643
Sap	N/A	N/A	N/A	N/A	N/A
Wood vinegar	N/A	N/A	N/A	N/A	N/A
Others	1,259	1,438	9,005	15,878	16,655

NWFP	Value in million Won				
	1998	**1999**	**2000**	**2001**	**2002**
Manure	333,545	340,629	182,365	207,831	193,909
Forage-fodder	84,971	76,820	62,682	53,202	129,399
Nuts and Fruits	293,343	349,248	391,258	417,756	403,898
Mushroom	134,546	182,239	201,000	204,823	253,401
Fiber material	1,488	4,511	3,733	5,675	5,651
Resin	541	574	514	366	315
Tannin	-	-	-	-	-
Medicinal plants	20,916	13,316	11,502	12,220	13,253
Oak cork	-	-	-	-	-
Bamboo shoot	1,244	1,131	1,320	1,313	784
Wild vegetable	103,844	123,473	200,518	170,448	162,500
Sap	6,211	7,435	6,710	6,368	6,538
Wood vinegar	3,187	4,073	6,054	13,223	7,734
Others	1,024,680	984,344	259,158	485,641	245,654

In above two tables the NWFP category "Others" represents those NWFPs, which were excluded in Table 13 due to measurement unit problem but whose values are available. These values are not further processed to keep consistency with Table 13.

Foreign Exchange Rate

Year	**1988**	**1989**	**1990**	**1991**	**1992**
Won to USD	684.10	679.60	716.40	760.80	788.40
Year	**1998**	**1999**	**2000**	**2001**	**2002**
Won to USD	1,204.00	1,138.00	1,264.50	1,313.50	1,186.20

The exchange rate in 2005 (July) In COIN system of FAO is 1001 Won = 1 US dollar.

14.3 Analysis and processing of national data

14.3.1 Calibration

This step is not needed.

14.3.2. Estimation and Forecasting

A. 1988 to 1992

NWFP	Value in 000 US dollars				
	1988	**1989**	**1990**	**1991**	**1992**
Manure	390,550	388,287	332,898	294,267	304,262
Forage-fodder	148,965	112,635	84,069	73,440	70,904
Nuts and Fruits	169,915	197,872	209,880	240,275	243,876
Mushroom	74,176	88,181	89,920	92,396	126,374
Fiber material	751	984	972	1,533	1,507
Resin	547	2,871	1,203	1,108	2,425
Tannin	99	207	219	184	75
Medicinal plants	11,454	11,126	14,492	16,893	18,226
Oak cork	54	50	27	33	34
Bamboo shoot	1,109	1,473	678	921	1,064
Wild vegetable	10,703	12,095	35,248	47,514	60,430
Sap	0	0	0	0	0
Wood vinegar	0	0	0	0	0

B. 1998 to 2002

NWFP	Value in 000 US dollars				
	1998	**1999**	**2000**	**2001**	**2002**
Manure	277,031	299,322	144,219	158,227	163,471
Forage-fodder	70,574	67,504	49,571	40,504	109,087
Nuts and Fruits	243,640	306,896	309,417	318,048	340,497
Mushroom	111,749	160,140	158,956	155,937	213,624
Fiber material	1,236	3,964	2,952	4,321	4,764
Resin	449	504	406	279	266
Tannin	0	0	0	0	0
Medicinal plants	17,372	11,701	9,096	9,303	11,173
Oak cork	0	0	0	0	0
Bamboo shoot	1,033	994	1,044	1,000	661
Wild vegetable	86,249	108,500	158,575	129,766	136,992
Sap	5,159	6,533	5,306	4,848	5,512
Wood vinegar	2,647	3,579	4,788	10,067	6,520

C. Five Year Averages

Type of NWFP	Value in 000 US dollars	
	1990	**2000**
Manure	342,053	208,454
Forage-fodder	98,003	67,448
Nuts and Fruits	212,364	303,700
Mushroom	94,210	160,081
Fiber material	1,149	3,447
Resin	1,631	381
Tannin	157	0
Medicinal plants	14,438	11,729
Oak cork	40	0
Bamboo shoot	1,049	946
Wild vegetable	33,198	124,016
Sap	0	5,472
Wood vinegar	0	5,520
Total	798,291	891,195

D. Estimating and Forecasting for 1990, 2000 and 2005

The 1990 and 2000 figures have been developed after reclassification (section 14.4) of the five year averaged data. The forecasted figures for 2005 have been developed by linear extrapolation of 1990 and 2000 figures.

FRA 2005 Categories	**1990**	**2000**	**2005**
Food	340,821	588,744	712,705
Fodder	98,003	67,448	52,171
Raw material for medicine and aromatic products	14,438	11,729	10,375
Raw material for colorants and dyes	1,788	381	Not appl.
Raw material for utensils, handicrafts & construction	40	Not appl.	Not appl.
Ornamental plants	Not appl.	Not appl.	Not appl.
Exudates	-	10,992	16,488
Other plant products	343,202	211,901	146,251

14.4 Reclassification into FRA 2005 classes

Type of NWFP	FRA2005 categories-Plant products/raw material							
	1	2	3	4	5	6	7	8
Manure								100
Forage-fodder		100						
Nuts and Fruits	100							
Mushroom	100							
Fiber material								100
Resin				100				
Tannin				100				
Medicinal plants			100					
Oak cork					100			
Bamboo shoot	100							
Wild vegetable	100							
Sap							100	
Wood vinegar							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	340,821	588,744	712,705
2. Fodder	98,003	67,448	52,171
3. Raw material for medicine and aromatic products	14,438	11,729	10,375
4. Raw material for colorants and dyes	1,788	381	Not appl.
5. Raw material for utensils, handicrafts & construction	40		i.d.
6. Ornamental plants	i.d.	i.d.	i.d.
7. Exudates		10,992	16,488
8. Other plant products	343,202	211,901	146,251
Animal products / raw material	n.a.	n.a.	n.a.
9. Living animals	n.a.	n.a.	n.a.
10. Hides, skins and trophies	n.a.	n.a.	n.a.
11. Wild honey and bee-wax	n.a.	n.a.	n.a.
12. Bush meat	n.a.	n.a.	n.a.
13. Raw material for medicine	n.a.	n.a.	n.a.
14. Raw material for colorants	n.a.	n.a.	n.a.
15. Other edible animal products	n.a.	n.a.	n.a.
16. Other non-edible animal products	n.a.	n.a.	n.a.
TOTAL			

14.6 Comments to National reporting table T14

1. The data is insufficient to report total value for NWFP removal.
2. The value reported exclude those products for which information on quantity is reported in numbers or volumes and where it is not possible to convert this data into mass.

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)
Statistical Yearbook of Forestry, Korea Forest Service. Korea.	M	Employment	1999-2003

15.2.2 Classification and definitions

National class	Definition
Employment in forestry	Employment related to forestry activities such as reforestation, tending, thinning, tree cutting, prevention of insects and diseases, construction of forest road and erosion control dam, etc

15.2.3 Original data

A. Regular Employment

Employer	Number of person -full year	
	1990	2000
Korea Forest Service	1511	961
Forest Research Institute	511	307
National Arboretum	-	40
Forest Aviation Office	27	97
Local Government Forestry Staff	3545	4,436
Forestry Cooperatives	1536	1994
Korea National Park Service	n.a	650
Total	7130	8485

B. Temporary Employment status in forestry (Unit : 1,000 person days)

Year	Employment (000 persons days)				
	1999	2000	2001	2002	2003
Temporary Employment in forestry	3,227	3,119	3,331	3,911	5,098

Data of forestry employment were based on the labour wages and budget, and official statistic for employment has been available from 1999.

15.3 Analysis and processing of national data

15.3.1 Calibration

This step is not needed

15.3.2 Estimation and forecasting

A. Regular Employees

Employees of Korean National Service have been treated as working for provision of services. The figure for 2000 has been treated as figure for 1990 as well. The rest of the employees work for many different aspects of forestry and therefore treated as working for "unspecified forestry activities.

FRA 2005 Categories	Employment (1000 person-years)	
	1990	2000
Primary production of goods		
Provision of services	0.65	0.65
Unspecified forestry activities	7.13	7.84
TOTAL	**7.78**	**8.49**

B. Temporary Workers

The information for 1990 is not available. The figure for 2000 has been adopted both for 1990 and 2000. The person days have been converted into person years by assuming that there are 260 working days in a year.

Employment	Employment (000 persons years)	
	1999	2000
Temporary Employment in forestry	12	12

15.4 Reclassification into FRA 2005 classes

This step is not needed.

15.5 Data for National reporting table T15

FRA 2005 Categories	Employment (1000 person-years)	
	1990	2000
Primary production of goods	12.00	12.00
Provision of services	0.65	0.65
Unspecified forestry activities	7.13	7.84
TOTAL	**19.78**	**20.49**

15.6 Comments to National reporting table T15