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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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The Global Forest Resources Assessment 2005 Country Report Series is designed to document and make available the information forming the basis for the FRA 2005 reports. The Country Reports have been compiled by officially nominated country correspondents in collaboration with FAO staff. Prior to finalisation, these reports were subject to validation by forestry authorities in the respective countries.

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1 Table T1 – Extent of Forest and Other wooded land

1.1 FRA 2005 Categories and definitions

Category	Definition
Forest	Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds <i>in situ</i> . 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 <i>in situ</i> ; 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
Data and maps from native birch woodlands survey*	H	Native birch woodlands	’72-’75 And ’87-’91	Fieldwork for the original was done in 1972- 1975 but in 1987- 1991 some field assessments were done that did partially improve the former survey, but it did not replace the former survey.
Annual reports on planted seedlings in the forestry in Iceland**	H	No. planted seedlings	Annually	This data is used to indirectly assess the area of afforestation
FAOSTAT		Total surface area, water bodies		
Landmælingar Íslands (E: National land survey of Iceland). Responsible: Steinunn Elva Gunnarsdóttir steinunn@lmi.is	H	Urban areas	1949-1950 1986-2000	Sum of the area of polygons from digital maps 1:50.000. As a estimate for Other land with tree cover.

* Published references:

Sigurðsson S. and Bjarnason H. (1977) *Skóglendi á Íslandi. Athuganir á stærð þess og ástandi. [Woodlands of Iceland. Inventory of area and condition]*. Reykjavík: Skógrækt ríkisins and Skógræktarfélag Íslands, 38 p. (In Icelandic).

Aradottir A.L., Thorsteinsson I. and Sigurdsson S. (2001). Distribution and characteristics of birch woodlands in North Iceland. In Wielgolaski F.E. (ed.) 2001. *Nordic Mountain Birch Ecosystems*. Man and the Biosphere Series Volume 27. UNESCO, Paris, and Partheon Publishing, Carnforth. 390 p.

Unpublished references:

Raw data and analyzed and aggregated data and maps made from the surveys of the native birch woodlands and forests. These data and maps are stored at the National Forest Inventory which is a division under Icelandic Forest Research. Head of the NFI is Arnór Snorrason (email: arnor@skogur.is).

**** Published references:**

The seedling production and plantations figures have been published in the annual journal of the Icelandic Forest Association almost without exception (Icelandic name of the journal: Ársrit Skógræktarfélags Íslands (from 1930 to 1991), Skógræktarritið (from 1992 up to day). Until 1987 the figures were included in the annual reports of the Forestry director for the State Forestry Service and in similar report of the Forest Association for the forest associations. Some articles who summarize these data have also been written in the same journal. In 1993 the staff of the Forest Association started to compile in one annual report information about number of seedling made and planted and have done up to day.

Unpublished references:

Tables in Excel with number of seedling made/planted each year for the period 1899-2003 worked out at the office of the Forest Association. Contact persons: Einar Gunnarsson (einar@skog.is) and Jón Geir Pétursson (jgp.skog.is). We have a copy of this table at NFI with further calculations where number of seedlings are converted to area of afforestation as described later in this chapter.

1.2.2 Classification and definitions

There is no official classification for forest and other wooded land in Iceland. But there is traditional classification between the native, self-regenerated birch woodlands and human induced plantations/seedlings of both native trees and exotics.

It is nevertheless possible, with help of data from former surveys to classify the birch woodlands into forests and other wooded land after the FAO classification.

We define half of all urban areas as Other land with tree cover. This assumption is build on the long tradition of growing ornamental trees in private and public areas both in the capital and the villages around the island.

National class	Definition
Birch forests	All lands dominated by native self-regenerated mountain birch (<i>Betula pubescens</i>). The mean height can vary from 0.3 m to 10.0 m.
Afforestation areas	Human induced afforestation. Mostly plantations, in few cases seeded areas.
Reforestation areas	Human induced reforestation. Mostly plantations, in the birch woodlands
Other land with trees	50 % of urban areas (17,000 ha)

Note: If different national data sources use different classes and definitions, a table such as above is needed for each relevant data source.

1.2.3 Original data

There have been two surveys on the native birch forests. One in 1972- 1975, a second in 1987-1991. In the latter survey some field assessments were done that did partially improve the first survey, but it was not a repetition and can therefore not give any possibilities of time series estimation. The latest analysis of the birch forests data does result in 120,600 ha. Using the same ratio between "forest" part of the birch area (14,2 %) and the woodland part of the birch (85,8%) as calculated for FRA 2000 results in; 17,000 ha of native forest and 104,000 ha of native woodlands.

No area survey have been done on afforestation/reforestation (AR) areas. But they are indirectly estimated after high quality annual statistics of number of seedlings planted.

Following assumptions are used when estimating the area of AR:

1. 1900-1970: Plantations in this period where mostly reforestation in native birch woodlands. Planting density (supplemental planting included): 4.000 seedlings / ha. Only 3/4 of these forest are assumed to have survived and grew up as forests. They are estimated to be 3,600 ha
2. 1971-1989: Plantations in this period where mostly afforestation on treeless former rangelands. Planting density(supplemental planting included): 4.000 seedlings / ha. Only 3/4 of these forest are assumed to have survived and grew up as forests. They are estimated to be 3,000 ha
3. 1990-2003: Plantations in this period are mostly afforestation on treeless former rangelands. Here the estimation is more fine tuned. Christmas trees plantations established in this period are excluded as they are mostly established through reforestation and do not add to the total plantation area.. Seedling of tree species used for shelterbelts are too excluded. A comparison of GIS data and seedling data of corresponding afforestation area was done for about 61% of total afforestation area of the year 2003. With these data we did calculate a planting density (supplemental planting included) much lower than before or: 2.350 seedlings / ha. Only 3/4 of these forest are assumed to survive and grow up as forests. They are therefore estimated to be 19,100 ha

1.3 Analysis and processing of national data

1.3.1 Calibration

1.3.2 Estimation and forecasting

Human induced forestation area in the reference year of FRA2005 will then be:

1. Human induced forestation area in 1990: It is the 1900-1970 period plus 1971-1989 plus 1990 = $3,600 + 3,000 + 1,000 = 7,600$ ha
2. Human induced forestation area in 2000: It is the 1900-1970 period plus 1971-1989 plus 1990-2000 = $3,600 + 3,000 + 14,700 = 21,300$ ha
3. Human induced forestation area in 2005: It is the 1900-1970 period plus 1971-1989 plus 1990-2003 plus forecasting for 2004 and 2005. We did use linear regression for the period 1990-2003 to predict area for 2004 and 2005. There is a slight increase in planting activity and the sum of the forecast was 2,900 ha. The result for 2005 will then be: $3,600 + 3,000 + 19,100 + 2,900 = 28,600$ ha.

Forest area in reference years will then be:

1. Forest area in 1990: It is the 1900-1970 period plus 1971-1989 plus 1990 plus the area of native forest = $3,600 + 3,000 + 1,000 + 17,000 = 24,600$ ha
2. Forest area in 2000: It is the 1900-1970 period plus 1971-1989 plus 1990-2000 plus the area of native forest = $3,600 + 3,000 + 14,700 + 17,000 = 38,300$ ha

3. Forest area in 2005: It is the 1900-1970 period plus 1971-1989 plus 1990-2003 plus forecasting for 2004 and 2005 plus the area of native forest = 3,600 + 3,000 + 19,100 + 2,900 + 17.000 = 45,600 ha.

1.4 Data for National reporting table T1

FRA 2005 Categories	Area (1000 hectares)		
	1990	2000	2005
Forest	25	38	46
Other wooded land	104	104	104
Other land	9 896	9 883	9 875
...of which with tree cover ¹⁾	8	8	8
Inland water bodies	275	275	275
TOTAL	10 300	10 300	10 300

- 1) Area of “Other land with tree cover” is included in the area reported under “Other land” and should therefore be excluded when calculating the total area for the country.

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)	Additional comments
Report on land use in Iceland*	L	Private, public, others, native birch forests	1985	A work done with the data from the survey of native woodlands 1972-5
Information from institutions in the forest sector.	L	Divisions between private and public	2004	NFI did a question rounding to the various actors of forestry in the country
Data and maps from native birch woodlands survey**	H	Native birch woodlands	'72-'75 And '87-'91	Fieldwork for the original was done in 1972- 1975 but in 1987-1991 some field assessments were done that did partially improve the former survey, but it did not replace the former survey.
Annual reports on planted seedlings in the forestry in Iceland**	H	No. planted seedlings	Annually	This data is used to indirectly assess the area of afforestation

* Published reference:

Landbúnaðarraðuneytið 1986. *Landnýting á Íslandi og forsendur fyrir landnýtingaráætlun [Landuse in Iceland and preconditions for landuseplan]*. Nefnd um landnýtingaráætlun. Landbúnaðarraðuneytið. Ríkisprentsmiðjan Gutenberg. Reykjavík. 105 pp.

** Same references as for T1.

2.2.2 Classification and definitions

Native birch forests and woodlands: Here we have to rely on an inventory done in 1985 on the first birch survey data from 1972-75. Results of that inventory were that forests and other wooded land were divided between categories:

National class	Definition
Private	Private ownership of native forests and woodlands
Municipal	Municipal ownership of native forests and woodlands
State	State ownership of native forests and woodlands
State Forest Service	State Forest Service ownership of native forests and woodlands
Other	Other undefined ownership of native forests and woodlands

2.2.3 Original data

The result of the 1985 analysis of the native forests and woodlands was:

National class	% of total
Private	69
Municipal	6
State	19
State Forest Service	4
Other	2

2.3 Analysis and processing of national data

2.3.1 Estimation and forecasting

Afforestation and reforestation

1. **1990-2003:** After question rounding among directors and managers of actors in afforestation, following estimates will be used when assessing the ownership of plantation forests in Iceland:
 - a. Regional farmer afforestation projects and farmer afforestation are assumed to be on private land.
 - b. Afforestation of forest associations, of the State Forest Service and the Soil Conservation Service are assumed to be on public land.
2. **1971-1989:** Analysing figures about produced seedlings and planted seedlings the private ownership ratio is estimated to 30% of total.
3. **1899-1970:** Analysing figures about produced seedlings and planted seedlings the private ownership ratio is estimated to 25% of total.

Same basic data and calculation routines as for table 1 are otherwise used.

Human induced forestation area split in ownership categories in the reference year of FRA2005 will then be: (In thousand ha)

	1899-1970	1971-1989	1990	acc. 1990	1990-2000	acc. 2000
Private ownership	0.9	0.9	0.2	2.0	6.7	8.5
Public ownership	2.7	2.1	0.8	5.6	7.9	12.7

2.4 Reclassification into FRA 2005 classes

Native birch forests and woodlands:

National class	FRA2005 class
Private	Private ownership
Municipal	Public ownership
State	Public ownership
State Forest Service	Public ownership
Other	Other ownership

Categories	Forest	Other wooded land
Private ownership	11.7	71.8
Public ownership	5.0	30.1
Other	0.3	2.1

The same figures will be used for 1990 and 2000. Same basic data and calculation routines as for table 1 are otherwise used.

2.5 Data for National reporting table T2

FRA 2005 Categories	Area (1000 hectares)			
	Forest		Other wooded land	
	1990	2000	1990	2000
Private ownership	13.7	20.2	71.8	71.8
Public ownership	10.6	17.7	30.1	30.1
Other ownership	0.3	0.3	2.1	2.1
TOTAL	24.6	38.2	104	104

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)	Additional comments
Data and maps from native birch woodlands survey*	H	Native birch woodlands	'72-'75 And '87-'91	Fieldwork for the original was done in 1972- 1975 but in 1987- 1991 some field assessments were done that did partially improve the former survey, but it did not replace the former survey.
Annual reports on planted seedlings in the forestry in Iceland*	H	No. planted seedlings	Annually	This data is used to indirectly assess the area of afforestation

* Same references and sources as for T1

3.2.2 Classification and definitions

The FRA 2005 classes are used.

3.2.3 Original data

Native birch forests and woodlands:

It is not possible to designate any primary function for the native birch forests and woodlands other than multiple one. They are more or less not fenced and therefore used for grazing of domestic animals, mostly sheep. In more modern time they are used for recreation and can therefore be classified as a forest and woodlands for social service. As remnants of the primary forests and woodlands which covered about 27% of the land area before settlement they play an important role in protection of soil and water and conservation of biodiversity. Very little part of the forests are thinned regularly and the wood sold on the market mostly as firewood. There are no area information available that can be used to put native forests and woodlands in designation classes with special function. The only solution is to put them all in the Multiple purpose class under "primary function" but under all the four first classes under "total area with function" for the forest part. The woodland part has no noticeable wood production and is therefore excluded from the class "production". Contribution of native forest and woodlands to table T3 will then be:

FRA 2005 Categories / Designated function	Area (1000 hectares)					
	Primary function			Total area with function		
	1990	2000	2005	1990	2000	2005
Forest						
Production				17	17	17
Protection of soil and water				17	17	17
Conservation of biodiversity				17	17	17
Social services				17	17	17
Multiple purpose	17	17	17	not appl.	not appl.	not appl.
No or unknown function				not appl.	not appl.	not appl.
Total - Forest				not appl.	not appl.	not appl.
Other wooded land						
Production						
Protection of soil and water				104	104	104
Conservation of biodiversity				104	104	104
Social services				104	104	104
Multiple purpose	104	104	104	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.

AR areas:

Here we have to rely on separate figures for projects and institutions and try define them in designation categories:

1. State forest service: The main purpose has changed through time. In the beginning more or less trials with wood production-forestry. Evolving to more multiple purpose forestry in 1980s and 1990s with weight on social services of so called "national forests".
2. The forest associations: They are more or less designated for social service but in minor degrees as protection of soil and water and for production. These areas are therefore designated for social service.

3. The national afforestation-project of land reclamation: Started in 1990 and is still ongoing. The primary function is protection of soil and water. Secondary function is social services.
4. The Soil Conservation Service: A state institution dealing with erosion and land degradation. The primary function is protection of soil and water.
5. The regional afforestation project. Their objectives are partially different, one of them being purely afforestation for timber production; others do separate between timber production and afforestation for more multiple uses such as soil and water protection, social services etc. One project does define all afforestation as a multiple use.

For the period 1990-2003 we can use the classification above. For the period 1899-1970 the forest association part of total annual plantation estimated to 50% and for the period 1971-1989 45%. This part is defined as a social service forest. The rest is defined as multiple purpose.

3.3 Analysis and processing of national data

3.3.1 Estimation and forecasting

In the forecasting for 2004 and 2005 average ratios for the period 1992-2003 was used. In general productions forest are not defined with other function. Forest for soil and water protection is defined with conservation of biodiversity and social service as secondary functions. Forests for social service and for multiple purpose are defined with production, protection of soil and water and conservation of biodiversity as a secondary function.

On the basis of this description the contribution of AR areas to table T3 will then be:

FRA 2005 Categories / Designated function	Area (1000 hectares)					
	Primary function			Total area with function		
	1990	2000	2005	1990	2000	2005
Forest						
Production	0.3	6.1	9.1	7.6	18.0	23.8
Protection of soil and water	0.0	3.3	4.8	7.3	15.2	19.5
Conservation of biodiversity				7.3	15.2	19,5
Social services	3.6	6.2	6.8	7.3	15.2	19,5
Multiple purpose	3.7	5.7	7.9	not appl.	not appl.	not appl.
No or unknown function				not appl.	not appl.	not appl.
Total - Forest	7.6	21.3	28.6	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.

3.4 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	0.3	6.1	9.1	24.6	35.0	40.8
Protection of soil and water	0.0	3.3	4.8	24.3	32.2	36.5
Conservation of biodiversity	0	0	0	24.3	32.2	36.5
Social services	3.6	6.2	6.8	24.3	32.2	36.5
Multiple purpose	20.7	22.7	24.9	not appl.	not appl.	not appl.
No or unknown function	0	0	0	not appl.	not appl.	not appl.
Total - Forest	24.6	38.3	45.6	not appl.	not appl.	not appl.
Other wooded land						
Production	0	0	0	0	0	0
Protection of soil and water	0	0	0	104	104	104
Conservation of biodiversity	0	0	0	104	104	104
Social services	0	0	0	104	104	104
Multiple purpose	104	104	104	not appl.	not appl.	not appl.
No or unknown function	0	0	0	not appl.	not appl.	not appl.
Total – Other wooded land	104	104	104	not appl.	not appl.	not appl.

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)	Additional comments
Data and maps from native birch woodlands survey*	H	Native birch woodlands	'72-'75 And '87-'91	Fieldwork for the original was done in 1972- 1975 but in 1987- 1991 some field assessments were done that did partially improve the former survey, but it did not replace the former survey.
Annual reports on planted seedlings in the forestry in Iceland*	H	No. planted seedlings	Annually	This data is used to indirectly assess the area of afforestation

* Same references and sources as for T1

4.2.2 Classification and definitions

FRA 2005 classes are used.

4.2.3 Original data

The same original data as in previous tables were used.

4.3 Analysis and processing of national data

Native birch forests and woodlands: As mentioned before this category is more or less used for grazing of domestic animals, mostly sheep, which characterize these areas. A minor part is fenced in modern time, which can be considered as human induced achievement so this part

of the native birch can not be defined as primary. No direct assist to natural regeneration does appear in general but indirect one with fencing which purely enhance natural regeneration. The native forests and woodlands are therefore defined as **Modified natural**.

AR-areas: The classification in table 4 is in a way inconsequent. All plantations, either by native or exotic species are done by reason and will therefore fit in the classes for productive or protective plantation. Then the Semi-natural class will be totally omitted. On the other hand one could classify all plantations with native dominance in the Semi-natural class but then productive and protective plantation with native species will be omitted. So this classification is difficult to handle. Here we will choose the prior procedure although it will leave us with empty class of Semi-natural. Just to inform FAO about how big part of the plantation forest in Iceland is of native species we display this figures:

(in 1,000 ha)	1990	2000	2005
Estimated area of plantations of native species	1.7	5.1	7.0

Plantations of native tree and shrub species: This is mostly only native Birch (*Betula pubescens*) but too in a very small extend Rowan (*Sorbus aucuparia*), Trembling Aspen (*Populus tremula*), Tea-leaved Willow (*Salix phylicifolia*) and Woolly Willow (*Salix lanata*). The classification in table 4 will be:

1. Plantations who where in the primary class of production and multiple purpose in Table 3 are classified as Productive plantation.
2. Plantations who where in the primary class of protection of soil and water and social service in Table 3 are classified as Protective plantation.

4.4 Data for National reporting table T4

FRA 2005 Categories	Area (1000 hectares)					
	Forest			Other wooded land		
	1990	2000	2005	1990	2000	2005
Primary	0	0	0	0	0	0
Modified natural	17	17	17	104	104	104
Semi-natural	0	0	0	0	0	0
Productive plantation	4.0	11.8	17.0	0	0	0
Protective plantation	3.6	9.5	11.6	0	0	0
TOTAL	24.6	38.3	45.6	104	104	104

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)	Additional comments
Data and maps from native birch woodlands survey*	M	Measured tree length linked to polygons	1987-91	Used to classify native forests into forests (>5m), woodlands (2-5m) and shrublands (<2m)
Annual report on planted seedlings in the forestry in Iceland*	H	No. planted seedlings	Annually	This data is used to indirectly assess the area of afforestation
Project assessing the growth potential of eleven tree species in Iceland**	H	Mean stem volume/ha	1999-2001	Used to calculate mean growing stock/ha for each 10 years age interval for eleven tree species
Single tree volume functions for eleven tree species in Icelandic Forestry ***	H	stem volume /tree	2001-2002	Used in the calculation of growing stock of measured plots in the growth potential project

* Same references and sources as for T1

** Published references:

Snorrason, A. & S. F. Einarsson (2001). Landsúttekt á skógræktarskilyrðum. Áfangaskýrsla 1997-2001 fyrir Vestfirði. *Rit Mógilsár Rannsóknastöðvar Skógræktar* 7: 64.

Snorrason, A. & S. F. Einarsson (2002). Landsúttekt á skógræktarskilyrðum. Áfangaskýrsla 1997-2002 fyrir Suðurland og Suðvesturland. *Rit Mógilsár Rannsóknastöðvar Skógræktar* 14: 68.

Snorrason, A., S. F. Einarsson, T. Traustason & B. Fanney D (2001). Landsúttekt á skógræktarskilyrðum. Áfangaskýrsla 1997-2001 fyrir Norðurland. *Rit Mógilsár Rannsóknastöðvar Skógræktar* 6: 71.

Snorrason, A., L. Heiðarsson & S. F. Einarsson (2002). Landsúttekt á skógræktarskilyrðum. Áfangaskýrsla 1997-2002 fyrir Austurland. *Rit Mógilsár Rannsóknastöðvar Skógræktar* 13: 68.

Snorrason, A., T. Traustason, S. F. Einarsson & B. Fanney D (2001). Landsúttekt á skógræktarskilyrðum. Áfangaskýrsla 1997-2001 fyrir Vesturland. *Rit Mógilsár Rannsóknastöðvar Skógræktar* 5: 70.

Unpublished references:

Raw data and analyzed and aggregated data made from the growth potential assessment. These data are stored at the National Forest Inventory which is a division under Icelandic Forest Research. Head of the NFI is Arnór Snorrason (email: arnor@skogur.is).

*** Published references:

Snorrason A & Einarsson S F 2004. Single tree biomass- and stem volume functions for eleven tree species used in Icelandic forestry. *Scandin. J. For. Res.* (submitted).

5.2.2 Classification and definitions

FRA 2005 definitions are used with exceptions described in thresholds further down in this report.

5.2.3 Original data

AR- areas: The assessment will be build on three data sources. The first one is a newly done growth measurement on eleven most used tree species in Icelandic Forestry. These tree species were measured on plots evenly spread around the country. The objective was to find out growth potential for these species. The species are: Downy birch (*Betula pubescens* Ehrh.). Black cottonwood (*Populus trichocarpa* Torr. & Gray). Rowan (*Sorbus aucuparia* L.) Fast-growing willow species; feltleaf willow (*Salix alaxensis* Cov.); dark-leaved willow (*Salix myrsinifolia* Salisb.). Picea spp. [Sitka spruce (*Picea sitchensis* (Bong.) Carr.); Engelmann spruce (*P. engelmanni* Parry); white spruce (*P. glauca* (Moench) Voss.) and Norway spruce (*P. abies* (L.) Karst.). Lodgepole pine (*Pinus contorta* Dougl.) Siberian larch (*Larix sibirica* Ledeb.). Total 1,940 measurements were done. For each species we calculated mean growing stock (stem volume) per ha in 10 years age classes.

The second data source is recently finished work on making single tree functions for stem volume (from stump to top of the tree) for the same eleven tree species.

The third data source is the annual report on planted seedling were we have already in table 1-5 used to estimate the area of AR. Now we used this data to make tree-species specific area estimate for each ten years age classes. Area for each age class was then multiplied with mean growing stock for each species. Tree species who were not among the eleven one will be classified with most related species. When forecasting we use species composition of the years 1990-2003 and former estimated area (see Table 1).

The results for AR areas are:

Afforestation / reforestation areas	Year		
	1990	2000	2005
Area (hectares)	7 600	21 300	28 600
Growing stock (m3/ha)	46.3	37.2	39.5
Growing stock (1000 m3)	352	792	1129

Native forests and woodlands: It is more difficult to estimate the wood stock of native forests and woodlands. Nevertheless we did try to make some estimates. Here we used two data sources. First, the growing stock measurement on Downy birch (*Betula pubescens* Ehrh.) who is totally dominating the native forests- and woodland in Iceland. The other native species have just sporadic presence. The measurements were classified in mean height classes and for each class a mean stem volume was calculated. The second data source is the

classification of the native forests and woodlands in the second survey (1987-91). There we used height classification of the area (ha):

	Forests	Woodlands	Shrublands	Total
Height definition	> 5 m	2-5 m	< 2 m	
Area (ha)	17,000	8,000	96,000	121,000

Shrublands are excluded from the wood stock calculation because they can poorly be utilized as a woody raw material.

Forests and woodlands growing stock are calculated by the average growing stock on the measurements plots of birch classified in each height category.

There are no possibilities to estimate commercial growing stock. The main reason is that there is no developed wood and timber market in the country. The very limited sales of wood give no possibilities to calculate marginal for utilisation of wood raw materials from the forests and woodlands.

The results of estimating growing stock for the native forests and woodlands will then be:

	Forests	Woodlands	Total
Height definition	> 5 m	2-5 m	
m ³ /ha	111	46	
Area (ha)	17,000	8,000	25,000
m ³	1,887,000	368,000	2,255,000

5.3 Analysis and processing of national data

By combining the above tables we get the following summary table:

	Growing stock on forest and woodlands (1000 m3)			
	Forest			Woodlands (2-5 m)
	1990	2000	2005	All reporting years
Native forests and woodlands	1887	1887	1887	368
Afforestation / reforestation areas	352	792	1129	0
Total Growing stock	2239	2679	3016	368

5.3.1 Estimation and forecasting

When forecasting we have used the species composition of the years 1990-2003 and former estimated area (see Table 1).

As mentioned before native forests/woodlands are assumed to be unchanged between 1990 and 2005 so we therefore assume that also the growing stock will be unchanged in this period.

5.4 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	2.24	2.68	3.02	0.37	0.37	0.37
Commercial growing stock	NA	NA	NA	NA	NA	NA

Specification of country threshold values	Unit	Value	Complementary information
1. Minimum diameter at breast height of trees included in Growing stock (X)	cm	0	
2. Minimum diameter at the top end of stem (Y) for calculation of Growing stock	cm	0	
3. Minimum diameter of branches included in Growing stock (W)	cm		No branches included
4. Minimum diameter at breast height of trees in Commercial growing stock (Z)	cm		Not available information
5. Volume refers to “Above ground” (AG) or “Above stump” (AS)	AG / AS	AS	Above stump
6. Have any of the above thresholds (points 1 to 4) changed since 1990	Yes/No	No	No threshold have been in use
7. If yes, then attach a separate note giving details of the change	Attachment		

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)	Additional comments
Data and maps from native birch woodlands survey*	M	Measured tree length linked to polygons	1987-91	Used to classify native forests into forests (>5m), woodlands (2-5m) and shrublands (<2m)
Annual report on planted seedlings in the forestry in Iceland*	H	No. planted seedlings	Annually	This data is used to indirectly assess the area of afforestation
Project assessing the growth potential of eleven tree species in Iceland**	H	Mean stem volume/ha	1999-2001	Used to calculate mean growing stock/ha for each 10 years age interval for eleven tree species
Single tree volume functions for eleven tree species in Icelandic Forestry **	H	stem volume /tree	2001-2002	Used in the calculation of growing stock of measured plots in the growth potential project
***	H	root/shoot ratio	1998-2001	Used to estimate root/shoot ratio
****	H	dead wood stock	2002-2003	Used to estimate dead wood stock for afforestation

* Same references and sources as for T1

** Same references and sources as for T5

*** Snorrason A., Sigurdsson B.D., Gudbergsson G., Svavarsdottir K., Jonsson Th.H. (2002). Carbon sequestration in forest plantations in Iceland, *Icel. Agric. Sci.* 15 (2002) 79-91.

**** Sigurdsson, Bjarni D., Borgthor Magnusson, Asrun Elmarsdottir and Brynhildur Bjarnadottir (2004). Effects of afforestation on biomass, carbon stock and composition of ground vegetation: a chronosequence study in Iceland. Intended for the *Annals of Forest Science*.

6.2.2 Classification and definitions

FRA 2005 definitions are used with exceptions described in thresholds further down in this report.

6.2.3 Original data

Here we use the same data sources and assessment methods as we did for T5 with few exceptions. The exceptions are:

1. Instead of stem volume functions we use functions for total biomass above ground (stump) for the eleven tree species.
2. We use country specific root/shoot ratio found in in-country research (Snorrason et.al. 2002). The ratio is: 0.2. Note that fine-roots are excluded and the stump is included in the belowground estimate.
3. Estimation for dead wood biomass in AR areas are done according to new in-country research. (Sigurdsson et.al. 2004). Dead wood is defined as coarse woody debris with diameter more than 2 cm. They are carefully estimated to 4 ton d.m. / ha after the forests reach 30 years age (this is more or less residuals after thinnings and in some cases dead trees).
4. Shrublands will be included in the biomass estimation. Gross estimate for area is 96,000 ha. Mean biomass stock above ground is estimated to 13 ton /ha in shrubland with full canopy cover. The mean canopy cover for the shrublands is estimated from the 1972-75 survey to be 50% lower so the mean biomass stock of the shrublands is estimated very carefully to 6 tons / ha.
5. To estimate dead wood biomass in native forests/woodlands we used default dead-life ratio of 14% given in Appendix 5 table 5.6.
6. To above ground biomass we add estimate of above ground biomass of other vegetation than trees. Average measures of 12 measurements plots was 3 tons/ha (Snorrason et.al. 2002). Another research with ca. 50 measurements did give biomass in other vegetation around 3.6 tons/ha (Sigurdsson et.al. 2004). Above ground biomass in other vegetation than trees will then be assumed 3.4 tons/ha.

6.3 Analysis and processing of national data

The biomass of AR areas are calculated as follows:

Biomass of Afforested / Reforested areas			
	1990	2000	2005
Area (ha)	7600	21300	28600
AGB trees (1000 tonnes *)	315	690	953
AGB trees (ton/ha) *	42,1	32,4	33,2
AGB other veg (ton/ha)	3.4	3.4	3.4
Total AGB (1000 tonnes)	341	762	1050
BGB (1000 tonnes)	63	138	191
DWB (1000 tonnes) **)	7	14	19
Total Biomass (1000 tonnes)	411	914	1260

*) Weighted averages obtained by applying species-wise functions to estimate above-ground biomass

***) Weighted average for all plantations. Plantations older than 30 years assumed to have 4 tonnes / ha

The biomass of native forests and woodlands are calculated as follows:

Biomass of native forests and woodlands (equal for all reporting years)			
	Forests	Woodlands	Shrublands
	> 5m	2-5 m	<2m
Area (ha)	17000	8000	96000
AGB trees (ton/ha) *)	87	49	6
AGB other veg (ton/ha)	3.4	3.4	3.4
Total AGB (1000 tonnes)	1537	419	902
BGB (1000 tonnes)	296	78	115
DWB (1000 tonnes)	248	66	97
Total Biomass (1000 tonnes)	2081	563	1114

*) Weighted averages obtained by applying species-wise function to estimate above-ground biomass

6.4 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	1.88	2.30	2.59	1.32	1.32	1.32
Below-ground biomass	0.36	0.43	0.49	0.19	0.19	0.19
Dead wood biomass	0.26	0.26	0.27	0.16	0.16	0.16
TOTAL	2.49	3.00	3.34	1.68	1.68	1.68

Thresholds used by the country are the following:

Threshold for deadwood: Minimum diameter: 2 cm

Threshold for fine-roots: Maximum diameter 5 mm.

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, fomic, 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)	Additional comments
Data and maps from native birch woodlands survey*	M	Measured tree length linked to polygons	1987-91	Used to classify native forests into forests (>5m), woodlands (2-5m) and shrublands (<2m)
Annual report on planted seedlings in the forestry in Iceland*	H	No. planted seedlings	Annually	This data is used to indirectly assess the area of afforestation
Project assessing the growth potential of eleven tree species in Iceland**	H	Mean stem volume/ha	1999-2001	Used to calculate mean growing stock/ha for each 10 years age interval for eleven tree species
Single tree volume functions for eleven tree species in Icelandic Forestry **	H	stem volume /tree	2001-2002	Used in the calculation of growing stock of measured plots in the growth potential project
***	H	root/shoot ratio litter stock	1998-2001	Used to estimate root/shoot ratio and C-stock in litter
***	H	dead wood stock	2002-2003	Used to estimate dead wood stock for afforestation

* Same references and sources as for T1

** Same references and sources as for T5

*** Same references and sources as for T6

7.2.2 Classification and definitions

FRA 2005 definitions are used.

7.2.3 Original data

We did use the same data sources and assessment methods as we did for T5 and T6 with some additions. They are:

1. Results from in-country research are used to estimate C-stock in litter. A average for 12 measurements for litter and dead wood was 6.0 tons C/ha (Snorrason et.al. 2002) and if we subtract dead wood of 2.0 tons C/ha (see estimate of dead wood in Table 6) it leave us with 4.0 tons C/ha of litter in forest plantations of various age and tree species. Because the litter is more or less concentrated to the area below the trees the litter area is decreased at same ratio as the mean canopy cover of shrublands. In the shrublands the litter is only the half of the litter in native forest with full canopy cover.
2. "Inorganic soils" of Iceland are mostly volcanic soils (Andosols). According to Appendix 5, Table 5.8 a default figure is 130 tonnes C/ha for 0-30 cm depth. The in-country research mentioned before did give lower figure, or 81 tonnes C/ha for 0-30 cm depth although total C-stock down to rock bed was quite higher or 148 tonnes C/ha. This high portion of organic C in soils in deep layers of the "Inorganic soils" is kind of a speciality for Iceland. The solution here is to report only soil C-stock above 30 cm soil depth although 82% more of C have been measured in soils deeper than 30 cm. We used the in-country measurement of 81 tonnes C/ha. They will be used for both native and planted forests and woodlands.

7.3 Analysis and processing of national data

Following the IPCC Good Practice Guidance, we calculated the Carbon Stock of AGB, BGB and dead wood biomass by multiplying the biomass values in table T6 with 0.5.

7.4 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	0.94	1.15	1.29	0.66	0.66	0.66
Carbon in below-ground biomass	0.18	0.22	0.24	0.10	0.10	0.10
Sub-total: Carbon in living biomass	1.12	1.37	1.54	0.76	0.76	0.76
Carbon in dead wood	0.13	0.13	0.13	0.08	0.08	0.08
Carbon in litter	0.10	0.15	0.18	0.21	0.21	0.21
Sub-total: Carbon in dead wood and litter	0.23	0.28	0.32	0.29	0.29	0.29
Soil carbon to a depth of 30 cm	2.03	3.08	3.65	8.42	8.42	8.42
TOTAL CARBON	3.37	4.73	5.50	9.47	9.47	9.47

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

It is not possible to give some figures in area but following report written by the entomologist Dr. Guðmundur Halldórsson gives some idea about diseases and insects affecting health and vitality of forests and woodlands.

In general one can assume that no major serious event have occurred in the period of 1985-2004, and therefore an area of zero hectares is reported in the reporting table.

The years: 1997, 1998, 1999, 2000, 2001 and 2002:

Insects

1. Weevil larvae (*Otiorhyncus nodosus* and *O. arcticus*), killed 10-15% of the seedlings in new plantations. (Reference; Guðmundur Halldórsson, Halldór Sverrisson, Guðríður Gyða Eyjólfsdóttir og Edda Sigurdís Oddsdóttir: (2000): Ectomycorrhizae Reduce Damage to Russian larch by *Otiorhyncus* larvae: Scandinavian Journal of Forest Research 15: 354-358.)
2. Lepidopteran larvae (*Epinotia solandriana* and *Acleris notana*) damaged native birch forests in Northeast Iceland (Guðmundur Halldórsson, unpublished data)

Pests

1. Poplar rust (*Melampsora laric-populina*) on Black cottonwood in South Iceland (Reference; Guðmundur Halldórsson, Halldór Sverrisson, Edda Sigurdís Oddsdóttir, Guðríður Gyða Eyjólfsdóttir.;(2001): Trjásjúkdómar. Rit Mógilsár Rannsóknastöðvar Skógræktar 4/2001 (Forest Diseases in Iceland. Icelandic Forestry Research 4/2001)
2. Larch needle cast disease (*Meria laricis*) on larch in South Iceland in 1999 and East Iceland in 2002. (Reference; Guðmundur Halldórsson, Halldór Sverrisson, Edda Sigurdís Oddsdóttir, Guðríður Gyða Eyjólfsdóttir.;(2001): Trjásjúkdómar. Rit Mógilsár Rannsóknastöðvar Skógræktar 4/2001 (Forest Diseases in Iceland. Icelandic Forestry Research 4/2001)

No published data exists on the effect of Lepidopteran larvae on growth and vitality of birch in Iceland. No published data exists on the effect of Poplar rust on growth and vitality of Black cottonwood in Iceland or on the effect of Larch needle cast disease on growth and vitality of larch. However, the effect of these diseases has been documented in many publications from other countries (see i.e. Phillips, D.H. and Burdekin D.A. 1992. Diseases of Forest and Ornamental Trees. ISBN 0-333-49493-8. The McMillan Press LTD. London and Basingstoke.)

8.3 Data for National reporting table T8

FRA-2005 Categories	Average annual area affected (1000 hectares)			
	Forests		Other wooded land	
	1990	2000	1990	2000
Disturbance by fire	0	0	0	0
Disturbance by insects	0	0	0	0
Disturbance by diseases	0	0	0	0
Other disturbance	0	0	0	0

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)	Additional comments
Stefánsson S. 1948. Flóra Íslands. III. útgáfa, Aukin. Hið Íslenska Náttúrufræðifélag. 407pp.				
IUCN Red list of threatened species (www.iucnredlist.org)				

9.3 Data for National reporting table T9

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

9.4 Comments to National reporting table T9

Native tree and shrub species are:

1. Trees:
 - a. Birch (*Betula pubescens*)
 - b. Rowan (*Sorbus aucuparia*)
 - c. Trembling Aspen (*Populus tremula*)
2. Shrubs:
 - a. Tea-leaved Willow (*Salix phylicifolia*)
 - b. Woolly Willow (*Salix lanata*)

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.

10.2 National data

10.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Data and maps from native birch woodlands survey*	M	Measured tree length linked to polygons	1987-91	Used to classify native forests into forests (>5m), woodlands (2-5m) and shrublands (<2m)
Annual report on planted seedlings in the forestry in Iceland*	H	No. planted seedlings	Annually	This data is used to indirectly assess the area of afforestation
Project assessing the growth potential of eleven tree species in Iceland**	H	Mean stem volume/ha	1999-2001	Used to calculate mean growing stock/ha for each 10 years age interval for eleven tree species
Single tree volume functions for eleven tree species in Icelandic Forestry **	H	stem volume /tree	2001-2002	Used in the calculation of growing stock of measured plots in the growth potential project

* Same references and sources as for T1

** Same references and sources as for T5

10.3 Data for National reporting table T10

FRA 2005 Categories / Species name (Scientific name and common name)	Growing Stock in Forests (million cubic meters)	
	1990	2000
Birch (<i>Betula pubescens</i>)	1.94	2.02
Sitka spruce (<i>Picea sitchensis</i> (Bong.) Carr.)	0.09	0.18
Siberian larch (<i>Larix sibirica</i> Ledeb.)	0.04	0.16
Lodgepole pine (<i>Pinus contorta</i> Dougl.)	0.03	0.09
Norway spruce (<i>P. abies</i> (L.) Karst.)	0.02	0.04
Mountain pine (<i>Pinus uncinata</i> Mill. ex Mirb.)	0.016	0.031
Black cottonwood (<i>Populus trichocarpa</i> Torr. & Gray)	0.004	0.019
Engelmann spruce (<i>P. engelmanni</i> Parry)	0.008	0.018
White spruce (<i>P. glauca</i> (Moench) Voss.)	0.006	0.010
Rowan (<i>Sorbus aucuparia</i> L.)	0.006	0.007
Remainder of species	0.08	0.105
TOTAL	2.24	2.68

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)	Additional comments
Annual report of wood sale of the State Forest Service*	M		1986-1987 1996-2003	Wood products made only at the State Forest Service

* Published references: As for the seedling production and plantations, figures for wood production have been published in the annual journal of the Icelandic Forest Association with some exceptions (Icelandic name of the journal: Ársrit Skógræktarfélags Íslands (from 1930 to 1991), Skógræktarritið (from 1992 up to day). Until 1987 the figures were included in the annual reports of the Forestry director for the State Forestry Service. From 1997 (for the year 1996) the Forest Association started to publish figures about wood production in its annual report of forest activity and have done it up to day.

Unpublished references: Tables in Excel with annual figures for the year: 1986-1987 and 1996-2003 for various products and conversions to cubic meters were worked out at the office of the Forest Association. Contact persons: Einar Gunnarsson (einar@skog.is). We have a copy of this table at NFI .

11.2.2 Classification and definitions

Same classes aggregated as FRA 2005

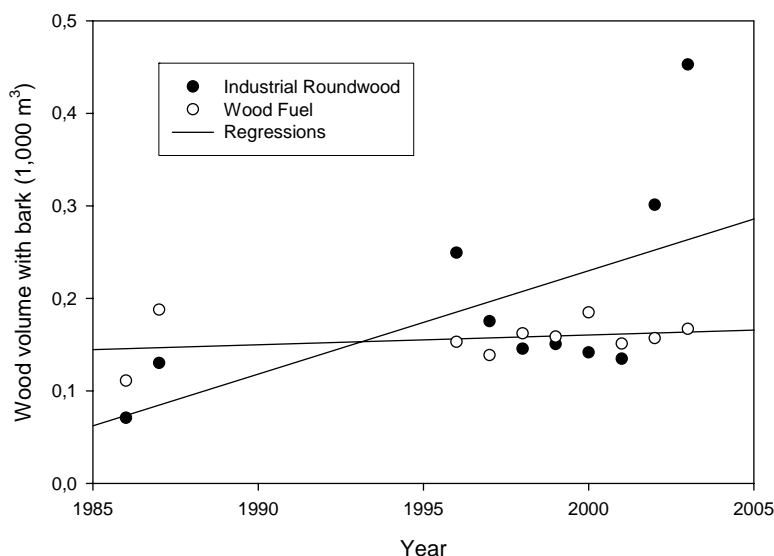
11.2.3 Original data

The table on the following page shows the original data on wood removals:

11.3 Analysis and processing of national data

11.3.1 Estimation and forecasting

We did make a linear regression to describe the relationship between annum and quantum. So the estimate for 1990 is an interpolation and estimate for 2005 an extrapolation. For the year 2000 we did use the average value for 1998-2002.



11.4 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	0.12	0.17	0.29	0	0	0
Woodfuel	0.15	0.16	0.17	0	0	0
TOTAL for Country	0.27	0.33	0.46	0	0	0

11.5 Comments to National reporting table T11

We have obtained data from the State Forest Service about removals from forest managed by the State Forest Service. There are some removals going on in other forests but they are not documented and can therefore not be estimated. Our judgement is that these removals are considerable lesser than of the State Forest Service. But nevertheless the figures in T11 are underestimates.

The removals are coming from plantations and native birch forests. It is possible that a very little part of the fuel wood originates from woodlands instead of forests but we have no data about the division between forests and woodland.

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)	Additional comments
Annual report of wood sale of the State Forest Service*	M		1986-1987 1996-2003	Wood products made only at the State Forest Service

* Same references and sources as for T11

12.2.2 Classification and definitions

Same classes aggregated as FRA 2005

12.2.3 Original data

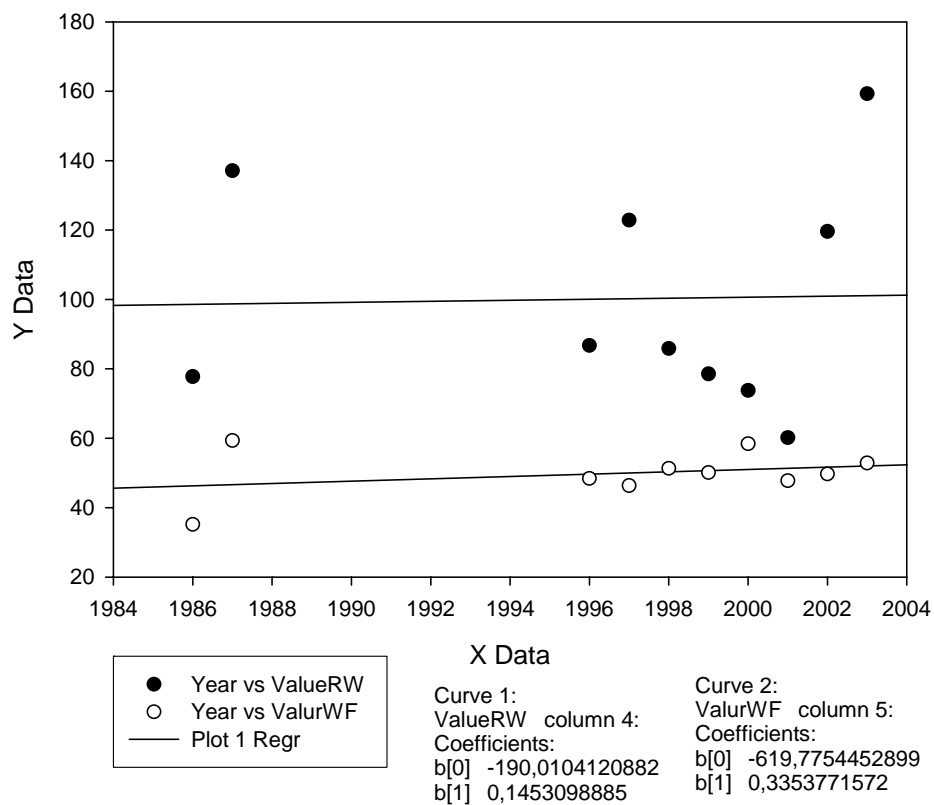
The table presented in chapter 11.2.3 shows the original data of production and current unit prices.

For each product current price per unit was used for all three reference years. Also, the current exchange rate (January 2005: 1 USD = 64 ISK) was used for all three reference years.

12.3 Analysis and processing of national data

12.3.1 Estimation and forecasting

Regression for estimating values was made and used in same way as in T11.



12.4 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	99	84	101	0	0	0
Woodfuel	47	51	53	0	0	0
TOTAL for Country	146	135	154	0	0	0

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
<u>Plant products / raw material</u>
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
<u>Animal products / raw material</u>
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)	Additional comments
Annual report of domestic Christmas tree production	M		1986-1987 1993-2003	Christmas tree production

* Published references: As for the seedling production and plantations, figures for domestic Christmas tree production have been published in the annual journal of the Icelandic Forest Association with some exceptions (Icelandic name of the journal: Ársrit Skógræktarfélags Íslands (from 1930 to 1991), Skógræktarritið (from 1992 up to day). Until 1987 the figures were included in the annual reports of the Forestry director for the State Forestry Service. From 1994 (for the year 1993) the Forest Association started to publish figures about wood production in its annual report of forest activity and have done it up to day.

Unpublished references: Tables in Excel with annual figures for the year: 1986-1987 and 1993-2003 for were worked out at the office of the Forest Association. Contact persons: Einar Gunnarsson (einar@skog.is). We have a copy of this table at NFI .

13.2.2 Classification and definitions

National class	Definition
Christmas tree	Christmas tree production of State Forest Service and the forest associations

13.3 Analysis and processing of national data

13.3.1 Estimation and forecasting

We used regression to estimate the number of trees in 1990 and 2005. But for 2000 we used average value for 1998 - 2002. Figures in italics are regression estimates the other are documented.

	Family tree no	Outdoor tree no	Sum no	Value USD
Unit price, \$	23,44	468,75		
Year				
1988	9.418	150	9.568	291.047
1989	8.965	150	9.115	280.430
1990	8.228	150	8.378	263.156
1990			<i>9.701</i>	<i>261.391</i>
1991			9.668	263.993
1992			<i>9.634</i>	<i>266.596</i>
1993	9.876	160	10.036	237.071
1994	9.820	170	9.990	236.071
1995	9.657	180	9.837	236.732
1996	10.312	180	10.492	248.429
1997	10.408	180	10.588	250.143
1998	10.679	180	10.859	347.947
1999	9.180	180	9.360	308.129
2000	9.581	180	9.761	318.781
2001	8.055	180	8.235	278.247
2002	7.832	180	8.012	272.323
2003	8.560	200	8.760	312.179
2004			<i>9.236</i>	<i>297.826</i>
2005			<i>9.203</i>	<i>300.428</i>

13.4 Data for National reporting table T13

FRA 2005 Categories	Scale factor	Unit	NWFP removal		
			1990	2000	2005
<u>Plant products / raw material</u>					
1. Food			NA	NA	NA
2. Fodder			0	0	0
3. Raw material for medicine and aromatic products			NA	NA	NA
4. Raw material for colorants and dyes			NA	NA	NA
5. Raw material for utensils, handicrafts & construction			NA	NA	NA
6. Ornamental plants (Christmas trees)	1	no.	9,700	9,245	9,200
7. Exudates			0	0	0
8. Other plant products			0	0	0
<u>Animal products / raw material</u>					
9. Living animals			0	0	0
10. Hides, skins and trophies			0	0	0
11. Wild honey and bee-wax			0	0	0
12. Bush meat			0	0	0
13. Raw material for medicine			0	0	0
14. Raw material for colorants			0	0	0
15. Other edible animal products			0	0	0
16. Other non-edible animal products			0	0	0

13.5 Comments to National reporting table T13

The number of Christmas trees is underestimated because the documentation is not fully covering all fellings. Slightly increasing private production and sale is not documented. Fellings for domestic use is too not documented.

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
<u>Plant products / raw material</u>
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
<u>Animal products / raw material</u>
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)	Additional comments
Annual report of domestic Christmas tree production*	M		1986-1987 1993-2003	Christmas tree production

* Same references and sources as for T12

14.3 Analysis and processing of national data

14.3.1 Estimation and forecasting

We did use regression to estimate value in 1990 and 2005. But for 2000 we used average value for 1998 - 2002. The exchange rate used was: 1 USD = 64 ISK. The result of the estimation and forecasting is presented in the table in chapter 13.3.1.

14.4 Data for National reporting table T14

FRA 2005 Categories	Value of the of NWFP removed (1000 USD)		
	1990	2000	2005
<u>Plant products / raw material</u>			
1. Food	NA	NA	NA
2. Fodder	0	0	0
3. Raw material for medicine and aromatic products	NA	NA	NA
4. Raw material for colorants and dyes	NA	NA	NA
5. Raw material for utensils, handicrafts & construction	NA	NA	NA
6. Ornamental plants (Christmas trees)	261	305	300
7. Exudates	0	0	0
8. Other plant products	0	0	0
<u>Animal products / raw material</u>			
9. Living animals	0	0	0
10. Hides, skins and trophies	0	0	0
11. Wild honey and bee-wax	0	0	0
12. Bush meat	0	0	0
13. Raw material for medicine	0	0	0
14. Raw material for colorants	0	0	0
15. Other edible animal products	0	0	0
16. Other non-edible animal products	0	0	0
TOTAL	261	305	300

14.5 Comments to National reporting table T14

Although the annual quantity of Christmas trees has slightly decreased, the annual value has increased. The explanation lies in increasing number of outdoor square trees which are much more expensive than family trees.

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)	Additional comments
Information from institutions in the forest sector.	L	No. of person-years in 1990 and 2000	2004-5	NFI did a question rounding to the various actors of forestry in the country

15.2.2 Classification and definitions

Same classes as FRA2005

15.2.3 Original data

The data presented in the final reporting table are original data obtained directly from the consulted institutions.

15.3 Analysis and processing of national data

15.3.1 Estimation and forecasting

In our question rounding we did only ask for information for 1990 and 2000.

15.4 Reclassification into FRA 2005 classes

As it was impossible to distinguish between employment related to primary production and services, all employment was classified as Unspecified forestry activities.

15.5 Data for National reporting table T15

FRA 2005 Categories	Employment (1000 person-years)	
	1990	2000
Primary production of goods	NA	NA
Provision of services	NA	NA
Unspecified forestry activities	0.156	0.147
TOTAL	0.156	0.147

15.6 Comments to National reporting table T15

Employment in forestry research, education and administration is excluded. It is difficult to get reliable information about employment, especially for the year 1990. These estimates are definitely underestimates because one group of forestry employee is mostly missing from this data. It is the group of people and youngsters working for the municipals. It was not possible to get information about this group. Although forest activities are increasing the employment doesn't. An explanation can be increased efficiency with more of the afforestation done by farmers and professionals on bigger area units than before.