



# Forestry Department

Food and Agriculture Organization of the United Nations

## Planted Forests and Trees Working Papers

### **Global Planted Forests Thematic: Supplementary Desk Study on Planted Forests**

**A. Del Lungo and J. Ball**

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The purpose of these papers is to provide early release of information on on-going activities and programmes, and to stimulate discussion.

Comments and feedback are welcome.

### For further information please contact:

Mr. Jim Carle, Senior Forestry Officer (Plantations and Protection)  
Forest Resources Development Service  
Forest Resources Division  
Forestry Department  
FAO  
Viale delle Terme di Caracalla  
I-00100 Rome (Italy)  
e-mail: [Jim.Carle@fao.org](mailto:Jim.Carle@fao.org)

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# Table of Contents

<i>Foreword</i>	4
<i>Acknowledgements</i>	6
<i>Contributors</i>	6
<i>Acronyms</i>	8
<b>1.0 Introduction</b>	<b>9</b>
<b>2.0 Methodology</b>	<b>10</b>
Figure 1 Information requested and collected in the questionnaire and in the desk study	10
<b>3.0 Country Assumptions and Data</b>	<b>12</b>
<b>3.1 Countries reporting Productive and Protective Plantation Forests to FRA 2005</b>	<b>12</b>
Albania	12
Georgia	12
Greece	12
Moldova, Republic of	13
Nigeria	13
Pakistan	13
Russian Federation	14
Thailand	14
Uruguay	14
<b>3.2 Countries reporting Plantation Forests and Semi-Natural Forests area to FRA 2005</b>	<b>15</b>
Austria	15
Belarus	15
Denmark	17
Estonia	17
Hungary	18
Ireland	19
Portugal	19
Romania	20
Spain	21
Switzerland	21
<b>3.3 Countries reporting Semi-Natural Forest area to FRA 2005</b>	<b>22</b>
Germany	22
<b>3.4 Countries that reported to FRA 2000 but that were unable to report to FRA 2005</b>	<b>22</b>
Cameroon	23
Congo DPR	23
Venezuela	23
<b>3.4 Countries not reporting Plantation Forests or Semi-Natural Forests to FRA 2000 or FRA 2005</b>	<b>24</b>
Canada	24
<b>4.0 Results and Analysis</b>	<b>25</b>
<b>Annex 1: FAO Working Paper series on planted forests</b>	<b>26</b>



## Foreword

The new concept of Planted Forests brings together two forest characteristics, formerly considered separately: Plantation Forests and Planted Semi-Natural Forest that, combined, make up the Planted Forests subset. The reason for this aggregation is that Planted Semi-Natural Forests have more in common with Plantations than with the other classification of Semi-Natural Forest, established by natural regeneration. Both Plantation Forests and Planted Semi-Natural Forests are managed more intensively than other types of Semi-Natural Forests and in particular they:

- Use similar types of planting stock, frequently derived from improved germplasm;
- Use similar methods of establishment and tending;
- Are intensively managed, including interventions for thinning and pruning;
- Produce outputs which are uniform in size and technical specification, and are frequently (but not always) intended for harvesting of wood and fibre for industrial use.

The Global Planted Forest Thematic also provides, for countries that were able to respond to the questionnaire, more detailed data on end use, ownership, species, areas, growth rates (MAI), rotation lengths, harvest yields and age class distribution for the Planted Component of Semi-Natural Forests (Productive and Protective) and Plantation Forests (Productive and Protective).

The starting point for this Global Planted Forest Thematic was the data already provided by countries to FRA 2005.

In order to obtain data on the Planted Semi-Natural Forest, and data on Plantation Forests to supplement that obtained in the Global Forest Resources Assessment of 2005, a questionnaire was sent in April 2005 to selected countries which accounted for most of the global area of Plantation Forests and Semi-Natural Forest. The countries selected included those with the 30 largest Plantation Forest areas reported in FRA 2000, as well as certain countries in Europe and North America which were believed to have significant Planted Semi-Natural Forest. The questionnaire, background and guidelines for its completion were sent to National Correspondents for FAO's Global Forest Resources Assessment, as well as other Planted Forests specialists.

The Global Planted Forest Thematic has been reported in Working Papers that detail survey, responses, associated desk study and results in status and trends as shown in the following Table.

No.	Title	Description
35	Global Planted Forests Thematic: Supplement to Forest Resources Assessment 2005. - Guidelines for National Reporting Tables for Planted Forests	Guidelines to National Correspondents for completion of reporting tables in the Planted Forests survey
35a	Global Planted Forests Thematic: Country Responses to Reporting Tables for Planted Forests Survey	Country reporting tables for 36 countries with major Planted Forests areas
<b>35b</b>	<b>Global Planted Forests Thematic: Supplementary Desk Study on Planted Forests</b>	<b>Supplementary desk study for 29 countries with significant areas of Planted Forests</b>
38	Global Planted Forests Thematic: Results, Conclusions and Recommendations	Main results, analysis, summary tables, figures, conclusions, recommendations, and full data tables in annexes

These Working Papers are aimed at a target audience of forestry planners and policy-makers as well as other interested parties, at national, regional and global levels. This Working Paper 35b (in **bold**) contains the reporting tables for the 36 countries with major areas of Planted Forests, that responded to the questionnaire.

This exercise is a “work in progress” as the Planted Forests concept is new to Global Forest Resources Assessments, but country data is still being collected and refined. Thus, this less formal Working Paper format was chosen. Readers are encouraged to send comments and especially new information which will contribute towards an authoritative FAO Forestry Paper, to be published in mid-2007.

## Acknowledgements

The Global Planted Forests Thematic Study represents the first attempt to produce reliable statistics on area, species information, growth parameters, ownership, end uses of Planted Forests in the world. Many people in the world has been involved in the exercise of providing and assessing data.

FAO is grateful to FRA National Correspondents, Planted Forests National specialists and their teams that had to reply to FAO questionnaires to provide the information that was then reviewed analysed and compiled at FAO Head Quarter.

FAO contributed to the study by providing a team composed by professionals, specialists and volunteers that contributed to the realization of the study.

FAO is grateful to all the contributors that made the study possible.

## Contributors

### National correspondents:

China	Mr. Su Chunyu, Mr. Huan Guosheng, Mr. Xia Chaozong
India	Mr. Devendra Pandey
United States of America	Mr. Brad Smith, Mr. Ray Sheffield
Japan	Mr. Hiro Miyazono
Indonesia	Mr. Hermawan Indrabudi
Brazil	Mr. Tasso Rezende de Azevedo, Mr. Joberto Freitas
Ukraine	Mr. Georgiy Bondaruk
Iran, Islamic Republic	Mr. Majid Seifollahian
Chile	Mr. Patricio González D.
United Kingdom	Mr. Simon Gillam
Turkey	Mr Sedat Kadioglu, Mr. Mehmet Ercan
Malaysia	Mr. Thai See Kiam
Viet Nam	Mr. Dinh Huu Khanh
South Africa	Mr. Sabelo Malaza
New Zealand	Mr. Paul Lane, Mr. Geoff Cameron
Australia	Mr. Adam Gerrand
Bulgaria	Ms. Albena Bobeva, Mr. N. Ionov
France	Mr. Claude Vidal, Ms. Nabila Hamza
Argentina	Ms. Mirta Rosa Larrieu
Myanmar	Mr. Sann Lwin
Philippines	Mr. Nestor A. Bambalan
Algeria	Mr. Ali Ghazi
Sudan	Mr. Salah Yousif, Ms. Nagla Dawelbait
Sweden	Mr. Jan-Olof Loman
Norway	Mr. Stein Michael Tomter
Lithuania	Mr. Andrius Kuliesis
Latvia	Mr. Normunds Struve
Italy	Mr. Angelo Mariano
Netherlands	Mr. Jaap M. Paasman
Croatia	Mr. Robert Ojurović, Mr. Tomislav Rožman
Poland	Mr. Roman Michalak

Slovakia	Mr. Martin Moravcik
Slovenia	Mr. Milan Hocevar
Belgium	Mr. Laurent Christian
Czech Republic	Mr. Vladimir Henzlik
Finland	Mr. Erkki Tomppo

**FAO/UNECE Staff, Consultants and Volunteers**

Sara Aberg, Jim Carle, Lei Chen, Nagla Dawelbait, Patrick Durst, Monica Garzuglia, Kailash Govil, Peter Holmgren, Sebueng Kelatwang, Alexander Korotkov, Mette Loyche Wilkie, Michèle Millanes, Hivy Ortiz, José Antonio Prado, Linda Rosengren, Mohamed Saket.

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## **Acronyms**

Congo DPR	Congo, Democratic People Republic
FAO	Food and Agriculture Organization
FRA	Forest resources Assessment
MAI	Mean Annual Increment



## 1.0 Introduction

Working Paper FP/35a presented a summary of the thirty six country responses to the questionnaire which was sent to fifty nine countries in 2005. These thirty six countries responded with information on their Plantation Forests and Planted Semi-Natural Forests for the years 1990, 2000, and 2005. Responses included 25 of the 30 countries with the most Plantation Forests in the world. It was calculated that the total area reported by the countries sampled accounted for 83% of the total global FRA Semi-Natural Forest area in all three years, as well as 72% of the total FRA Plantation Forests in 1990, 71% in 2000 and 72% in 2005.

But although the total area covered by the sample was high there were nevertheless some regions under-represented, and countries with significant areas of Planted Forests that were not included. A desk study on the Planted Forests of an additional 25 countries was therefore carried out to supplement the information obtained from the sample. The total area reported by the countries included in the desk study accounted for 12% of the Global FRA Semi-Natural Forest Area in all the three years.

The following twenty one countries reported to FRA on the area of Plantations or Semi-Natural forest, or both, but did not respond to the questionnaire, while four countries neither reported to FRA nor responded to the questionnaire.

**Table 1. Countries not responding to the questionnaire but included in the desk study**

<b>Countries which reported to FRA2005</b>	<b>Countries which did not report to FRA2005</b>
Albania (Plantations)	Canada (unable to report Semi-Natural to FRA 2005)
Austria (Semi-Natural and Plantations)	Cameroon (unable to report Plantations to FRA 2005)
Belarus (Semi-Natural and Plantations)	Congo DPR (unable to report Plantations to FRA 2005)
Bosnia and Herzegovina (Semi-Natural and Plantations)	Venezuela (unable to report Plantations to FRA 2005)
Denmark (Semi-Natural and Plantations)	
Estonia (Semi-Natural and Plantation)	
Georgia (Plantations)	
Germany (Semi-Natural)	
Greece (Plantations)	
Hungary (Semi-Natural and Plantations)	
Ireland (Semi-Natural and Plantations)	
Moldova, Republic of (Plantations)	
Nigeria (Plantations)	
Pakistan (Plantations)	
Portugal (Semi-Natural and Plantations)	
Romania (Semi-Natural and Plantations)	
Russian Federation (Plantations)	
Spain (Semi-Natural and Plantations)	
Switzerland (Semi-Natural and Plantations)	
Thailand (Plantations)	
Uruguay (Plantations)	

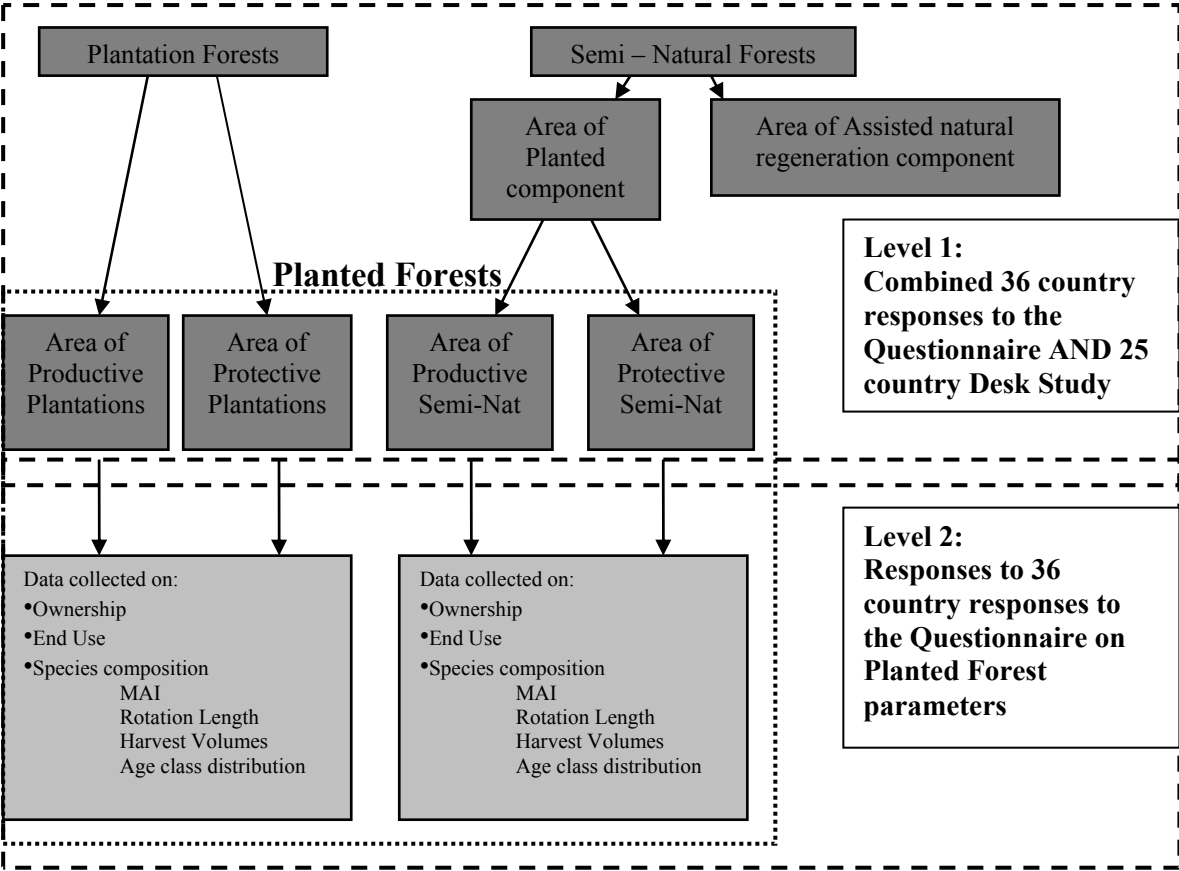
Of the 25 countries covered by the desk study 13 countries were recorded as having Semi-Natural Forests and 22 as having Plantation Forests. Sources and methodologies to estimate Planted Forest area are presented in this Working Paper (FP/35b). Figures were extrapolated at year 2005 for Bulgaria which only reported to FRA 2005 for years 1990 and 2000.

## 2.0 Methodology

The Aim of the desk study was to supplement the Planted Forests area data collected from the countries that replied to first part of the questionnaire or Level 1 of the study as reported in Figure1.

No data relevant to Level 2 of the questionnaire, to detail Planted Forest by ownership, end use, species composition, MAI, harvested volumes and age class distribution was collected by this Desk Study.

**Figure 1 Information requested and collected in the questionnaire and in the desk study**



The starting point of the study was the area by forest categories provided to FRA 2005 and 25 countries, unable to respond to the questionnaire, were included in the desk study. Of these countries:

- Nine reported only Plantation Forests to FRA 2005
- Eleven countries of the sample that reported to FRA 2005 for both Plantation Forests and Semi-Natural Forests
- One more country reported only Semi-Natural Forests to FRA 2005
- Three additional countries reported Plantation Forests to FRA 2000 but were unable to report to FRA 2005
- One country was unable to report Plantation Forests or Semi-Natural Forests to FRA 2000 or FRA 2005

The entire Plantation Forests area reported to FRA 2005 by the countries included in the desk study was compiled into the database together with all 36 countries that replied to the questionnaire.

A search on available data sources was carried out both in house and on the internet to find information and data to determine the Planted Semi-Natural Forests for those countries that reported Semi-Natural Forests to FRA 2005.

Research from available data was undertaken to determine the area of Semi-Natural Forests and Plantation Forests for Cameroon, Canada, Congo DPR and Venezuela, the countries that did not report to FRA 2005.

Results of the study are reported country by country in the next chapter

## 3.0 Country Assumptions and Data

### 3.1 Countries reporting Productive and Protective Plantation Forests to FRA 2005

#### Albania

Forest categories reported to FRA 2005      Productive and Protective Plantation Forests  
Years reported to FRA 2005:                      1990   2000   2005

Sources

- [Global FRA 2005 Country Report 134: Albania. FAO – Forestry Department, Rome 2005](#)

Productive and Protective Plantation Forest area was compiled in the database.

Plantation Forests area reported to FRA 2005 (1 000 ha)

1990		2000		2005	
Productive	Protective	Productive	Protective	Productive	Protective
11	93	5	92	3	86

#### Georgia

Forest categories reported to FRA 2005      Protective Plantation Forests  
Years reported to FRA 2005:                      1990   2000   2005

Sources

- [Global FRA 2005 Country Report 167: Georgia. FAO – Forestry Department, Rome 2005](#)

Protective Plantation Forests area was compiled in the database.

Plantation Forests area reported to FRA 2005 (1 000 ha)

1990		2000		2005	
Productive	Protective	Productive	Protective	Productive	Protective
0	54	0	60	0	61

#### Greece

Forest categories reported to FRA 2005      Protective Plantation Forests  
Years reported to FRA 2005:                      1990   2000   2005

Sources

- [Global FRA 2005 Country Report 169: Greece. FAO – Forestry Department, Rome 2005](#)

Protective Plantation Forests area was compiled in the database.

Plantation Forests area reported to FRA 2005 (1 000 ha)

1990		2000		2005	
Productive	Protective	Productive	Protective	Productive	Protective
0	118	0	129	0	134

## Moldova, Republic of

Forest categories reported to FRA 2005      Productive Plantation Forests  
 Years reported to FRA 2005:                    1990   2000   2005

Sources

- [Global FRA 2005 Country Report 133: Republic of Moldova. FAO – Forestry Department, Rome 2005](#)

Productive Plantation Forests area was compiled in the database.

Plantation Forests area reported to FRA 2005 (1 000 ha)

1990		2000		2005	
Productive	Protective	Productive	Protective	Productive	Protective
1	0	1	0	1	0

## Nigeria

Forest categories reported to FRA 2005      Productive Plantation Forests  
 Years reported to FRA 2005:                    1990   2000   2005

Sources

- [Global FRA 2005 Country Report 196: Nigeria. FAO – Forestry Department, Rome 2005](#)

Productive Plantation Forests area was compiled in the database.

Plantation Forests area reported to FRA 2005 (1 000 ha)

1990		2000		2005	
Productive	Protective	Productive	Protective	Productive	Protective
251	0	316	0	349	0

## Pakistan

Forest categories reported to FRA 2005      Productive Plantation Forests  
 Years reported to FRA 2005:                    1990   2000   2005

Sources

- [Global FRA 2005 Country Report 198: Pakistan. FAO – Forestry Department, Rome 2005](#)

Productive Plantation Forests area was compiled in the database.

Plantation Forests area reported to FRA 2005 (1 000 ha)

1990		2000		2005	
Productive	Protective	Productive	Protective	Productive	Protective
294	0	296	0	318	0

## Russian Federation

Forest categories reported to FRA 2005      Productive and Protective Plantation Forests  
 Years reported to FRA 2005:                      1990   2000   2005

Sources

- [Global FRA 2005 Country Report 053: Russian Federation. FAO – Forestry Department, Rome 2005](#)

Productive and Protective Plantation Forests area was compiled in the database.

Plantation Forests area reported to FRA 2005 (1 000 ha)

1990		2000		2005	
Productive	Protective	Productive	Protective	Productive	Protective
9,244	3,407	10,712	4,648	11,888	5,075

## Thailand

Forest categories reported to FRA 2005      Productive and Protective Plantation Forests  
 Years reported to FRA 2005:                      1990   2000   2005

Sources

- [Global FRA 2005 Country Report 217: Thailand. FAO – Forestry Department, Rome 2005](#)

Productive and Protective Plantation Forests area was compiled in the database.

Plantation Forests area reported to FRA 2005 (1 000 ha)

1990		2000		2005	
Productive	Protective	Productive	Protective	Productive	Protective
1,979	661	1,996	1,081	1,997	1,102

## Uruguay

Forest categories reported to FRA 2005      Productive and Protective Plantation Forests  
 Years reported to FRA 2005:                      1990   2000   2005

Sources

- [Global FRA 2005 Country Report 226: Uruguay. FAO – Forestry Department, Rome 2005](#)

Productive and Protective Plantation Forests area was compiled in the database.

Plantation Forests area reported to FRA 2005 (1 000 ha)

1990		2000		2005	
Productive	Protective	Productive	Protective	Productive	Protective
197	4	655	14	751	15

### 3.2 Countries reporting Plantation Forests and Semi-Natural Forests area to FRA 2005

#### Austria

Forest categories reported to FRA 2005      Semi-Natural and Productive Plantation Forests  
 Years reported to FRA 2005:                      1990    2000

Sources

- [Global FRA 2005 Country Report 140: Austria. FAO – Forestry Department, Rome 2005](#)
- [State of Europe's Forests 2003. The MCPFE Report on Sustainable Forest Management in Europe. MCPFE Liaison Unit Vienna and UNECE/FAO 2003](#)

Productive Plantation Forest area was compiled in the database. A planting/seeding rate reported in literature was applied to the area of Semi-Natural Forests to extract the planted component. The Planted Semi-Natural Forests area was then divided into productive/protective by applying the same ratio reported for Plantation Forests. No change in Planted Forests area was assumed to have occurred between years 2000 and 2005 therefore the same figures extracted for year 2000 were also reported at year 2005.

Planting/seeding rate of total generation types

1990-2000-2005 <sup>(1)</sup>
14.0 %

<sup>(1)</sup>Assumed to be the same for years 1990, 2000 and 2005

Semi-Natural Forests area reported to FRA 2005 (1 000 ha)

1990	2000	2005
1,933	1,963	1,963

Plantation Forests area reported to FRA 2005 (1 000 ha)

1990		2000		2005 <sup>(1)</sup>	
Productive	Protective	Productive	Protective	Productive	Protective
998	0	1,003	0	1,003	0

<sup>(1)</sup>Figures reported from year 2000

#### Belarus

Forest categories reported to FRA 2005      Semi-Natural and Productive Plantation Forests  
 Years reported to FRA 2005:                      1990    2000    2005

Sources

- [Global FRA 2005 Country Report 142: Belarus. FAO – Forestry Department, Rome 2005](#)

- [State of Europe's Forests 2003. The MCPFE Report on Sustainable Forest Management in Europe. MCPFE Liaison Unit Vienna and UNECE/FAO 2003](#)

Productive Plantation Forests area was compiled in the database. A planting/seeding rate reported in literature was applied to the area of Semi-Natural Forests to extract the planted component. The Planted Semi-Natural Forests area was then divided into productive/protective by applying the same ratio reported for Plantation Forests.

Planting/seeding rate of total generation types

<b>1990-2000-2005<sup>(1)</sup></b>
<b>84.7%</b>

<sup>(1)</sup>Assumed to be the same for years 1990, 2000 and 2005

Semi-Natural Forests area reported to FRA 2005 (1 000 ha)

<b>1990</b>	<b>2000</b>	<b>2005</b>
1,570	1,691	1,780

Plantation Forests area reported to FRA 2005 (1 000 ha)

<b>1990</b>		<b>2000</b>		<b>2005</b>	
<b>Productive</b>	<b>Protective</b>	<b>Productive</b>	<b>Protective</b>	<b>Productive</b>	<b>Protective</b>
2	0	2	0	2	0

## Bosnia and Herzegovina

Forest categories reported to FRA 2005      Semi-Natural, Productive and Protective  
Plantation Forests

Years reported to FRA 2005:                      1990   2000   2005

Sources

- [Global FRA 2005 Country Report 147: Bosnia and Herzegovina. FAO – Forestry Department, Rome 2005](#)
- [State of Europe's Forests 2003. The MCPFE Report on Sustainable Forest Management in Europe. MCPFE Liaison Unit Vienna and UNECE/FAO 2003](#)

Productive and Protective Plantation Forests area was compiled in the database. No planting rate was found on literature for this country therefore an averaged planting/seeding rate calculated upon Croatia, Slovakia and Slovenia, neighbouring countries of Bosnia and Herzegovina, was applied to the area of Semi-Natural Forests to extract the planted component. The Planted Semi-Natural Forests area was then divided into productive/protective by applying the same ratio reported for Plantation Forests.

Planting/seeding rate of total generation types

<b>1990-2000-2005<sup>(1)</sup></b>
<b>88.4 %</b>

<sup>(1)</sup>Assumed to be the same for years 1990, 2000 and 2005

Semi-Natural Forests area reported to FRA 2005 (1 000 ha)

<b>1990</b>	<b>2000</b>	<b>2005</b>
1,047	857	857

Plantation Forests area reported to FRA 2005 (1 000 ha)

<b>1990</b>		<b>2000</b>		<b>2005</b>	
<b>Productive</b>	<b>Protective</b>	<b>Productive</b>	<b>Protective</b>	<b>Productive</b>	<b>Protective</b>
0	0	142	0	142	0

## Denmark

Forest categories reported to FRA 2005      Semi-Natural, Productive and Protective  
 Plantation Forests  
 Years reported to FRA 2005:                      1990   2000   2005

### Sources

- [Global FRA 2005 Country Report 035: Denmark. FAO – Forestry Department, Rome 2005](#)
- [State of Europe's Forests 2003. The MCPFE Report on Sustainable Forest Management in Europe. MCPFE Liaison Unit Vienna and UNECE/FAO 2003](#)

Productive and Protective Plantation Forests area was compiled in the database. A planting/seeding rate reported in literature was applied to the area of Semi-Natural Forests to extract the planted component. The Planted Semi-Natural Forests area was then divided into productive/protective by applying the same ratio reported for Plantation Forests.

### Planting/seeding rate of total generation types

<b>1990-2000-2005<sup>(1)</sup></b>
<b>87.0%</b>

<sup>(1)</sup>Assumed to be the same for years 1990, 2000 and 2005

### Semi-Natural Forests area reported to FRA 2005 (1 000 ha)

1990	2000	2005
154	175	179

### Plantation Forests area reported to FRA 2005 (1 000 ha)

1990		2000		2005	
Productive	Protective	Productive	Protective	Productive	Protective
257	34	271	34	281	34

## Estonia

Forest categories reported to FRA 2005      Semi-Natural and Productive Plantation Forests  
 Years reported to FRA 2005:                      1990   2000   2005

### Sources

- [Global FRA 2005 Country Report 164: Estonia. FAO – Forestry Department, Rome 2005](#)
- [State of Europe's Forests 2003. The MCPFE Report on Sustainable Forest Management in Europe. MCPFE Liaison Unit Vienna and UNECE/FAO 2003](#)

Productive Plantation Forests area was compiled in the database. A planting/seeding rate reported in literature was applied to the area of Semi-Natural Forests to extract the planted component. The Planted Semi-Natural Forests area was then divided into productive/protective by applying the same ratio reported for Plantation Forests

Planting/seeding rate of total generation types

<b>1990-2000-2005<sup>(1)</sup></b>
<b>67.2%</b>

<sup>(1)</sup>Assumed to be the same for years 1990, 2000 and 2005

Semi-Natural Forests area reported to FRA 2005 (1 000 ha)

1990	2000	2005
0	687	751

Plantation Forests area reported to FRA 2005 (1 000 ha)

1990		2000		2005	
Productive	Protective	Productive	Protective	Productive	Protective
0	0	1	0	1	0

## Hungary

Forest categories reported to FRA 2005      Semi-Natural, Productive and Protective  
Plantation Forests

Years reported to FRA 2005:                      1990   2000   2005

Sources

- [Global FRA 2005 Country Report 023: Hungary. FAO – Forestry Department, Rome 2005](#)
- [State of Europe's Forests 2003. The MCPFE Report on Sustainable Forest Management in Europe. MCPFE Liaison Unit Vienna and UNECE/FAO 2003](#)

Productive and Protective Plantation Forests area was compiled in the database. A planting/seeding rate reported in literature was applied to the area of Semi-Natural Forest to extract the planted component. The Planted Semi-Natural Forests area was then divided into productive/protective by applying the same ratio reported for Plantation Forests

Planting/seeding rate of total generation types

<b>1990-2000-2005<sup>(1)</sup></b>
<b>54.3%</b>

<sup>(1)</sup>Assumed to be the same for years 1990, 2000 and 2005

Semi-Natural Forests area reported to FRA 2005 (1 000 ha)

1990	2000	2005
519	979	1,016

Plantation Forests area reported to FRA 2005 (1 000 ha)

1990		2000		2005	
Productive	Protective	Productive	Protective	Productive	Protective
39	392	439	89	455	91

## Ireland

Forest categories reported to FRA 2005      Semi-Natural and Productive Plantation Forests  
 Years reported to FRA 2005:                      1990   2000   2005

### Sources

- [Global FRA 2005 Country Report 085: Ireland. FAO – Forestry Department, Rome 2005](#)
- [State of Europe's Forests 2003. The MCPFE Report on Sustainable Forest Management in Europe. MCPFE Liaison Unit Vienna and UNECE/FAO 2003](#)

Productive Plantation Forests area was compiled in the database. A planting/seeding rate reported in literature was applied to the area of Semi-Natural Forest to extract the planted component. The Planted Semi-Natural Forests area was then divided into productive/protective by applying the same ratio reported for Plantation Forests

### Planting/seeding rate of total generation types

<b>1990-2000-2005<sup>(1)</sup></b>
<b>100%</b>

<sup>(1)</sup>Assumed to be the same for years 1990, 2000 and 2005

### Semi-Natural Forests area reported to FRA 2005 (1 000 ha)

1990	2000	2005
90	90	90

### Plantation Forests area reported to FRA 2005 (1 000 ha)

1990		2000		2005	
Productive	Protective	Productive	Protective	Productive	Protective
350	0	519	0	579	0

## Portugal

Forest categories reported to FRA 2005      Semi-Natural, Productive and Protective  
 Plantation Forests  
 Years reported to FRA 2005:                      1990   2000   2005

### Sources

- [Global FRA 2005 Country Report 070: Portugal. FAO – Forestry Department, Rome 2005](#)
- [State of Europe's Forests 2003. The MCPFE Report on Sustainable Forest Management in Europe. MCPFE Liaison Unit Vienna and UNECE/FAO 2003](#)

Productive and Protective Plantation Forests area was compiled in the database. A planting/seeding rate reported in literature was applied to the area of Semi-Natural Forests area to extract the planted component. The Planted Semi-Natural Forests area was then divided into productive/protective by applying the same ratio reported for Plantation Forests

Planting/seeding rate of total generation types

<b>1990-2000-2005<sup>(1)</sup></b>
<b>16.0%</b>

<sup>(1)</sup>Assumed to be the same for years 1990, 2000 and 2005

Semi-Natural Forests area reported to FRA 2005 (1 000 ha)

1990	2000	2005
2,494	2,494	2,494

Plantation Forests area reported to FRA 2005 (1 000 ha)

1990		2000		2005	
Productive	Protective	Productive	Protective	Productive	Protective
383	167	867	167	1,067	167

## Romania

Forest categories reported to FRA 2005      Semi-Natural, Productive and Protective  
Plantation Forests

Years reported to FRA 2005:                      1990   2000   2005

Sources

- [Global FRA 2005 Country Report 064: Romania. FAO – Forestry Department, Rome 2005](#)
- [State of Europe's Forests 2003. The MCPFE Report on Sustainable Forest Management in Europe. MCPFE Liaison Unit Vienna and UNECE/FAO 2003](#)

Productive and Protective Plantation Forests area was compiled in the database. No planting rate was found on literature for this country therefore an averaged planting/seeding rate calculated upon Hungary, Bulgaria and Ukraine, countries neighbouring Romania, was applied to the area of Semi-Natural Forests to extract the planted component. The Planted Semi-Natural Forests area was then divided into productive/protective by applying the same rate reported for Plantation Forests

Planting/seeding rate of total generation types

<b>1990-2000-2005<sup>(1)</sup></b>
<b>97.7%</b>

<sup>(1)</sup>Assumed to be the same for years 1990, 2000 and 2005

Semi-Natural Forests area reported to FRA 2005 (1 000 ha)

1990	2000	2005
5,339	5,334	5,339

Plantation Forests area reported to FRA 2005 (1 000 ha)

1990		2000		2005	
Productive	Protective	Productive	Protective	Productive	Protective
92	57	92	57	92	57

## Spain

Forest categories reported to FRA 2005      Semi-Natural and Productive Plantation Forests  
 Years reported to FRA 2005:                      1990    2000    2005

### Sources

- [Global FRA 2005 Country Report 211: Spain. FAO – Forestry Department, Rome 2005](#)
- [State of Europe's Forests 2003. The MCPFE Report on Sustainable Forest Management in Europe. MCPFE Liaison Unit Vienna and UNECE/FAO 2003](#)

Productive Plantation Forests area was compiled in the database. No planting rate was found on literature for this country therefore an averaged planting/seeding rate, calculated upon Portugal and France, neighbouring countries of Spain, was applied to the area of Semi-Natural Forests area to extract the planted component. The Planted Semi-Natural Forests area was then divided into productive/protective by applying the same ratio reported for Plantation Forests

### Planting/seeding rate of total generation types

<b>1990-2000-2005<sup>(1)</sup></b>
<b>10.0%</b>

<sup>(1)</sup>Assumed to be the same for years 1990, 2000 and 2005

### Semi-Natural Forests area reported to FRA 2005 (1 000 ha)

1990	2000	2005
2,867	3,656	4,050

### Plantation Forests area reported to FRA 2005 (1 000 ha)

1990		2000		2005	
Productive	Protective	Productive	Protective	Productive	Protective
1,126	0	1,356	0	1,471	0

## Switzerland

Forest categories reported to FRA 2005      Semi-Natural and Productive Plantation Forests  
 Years reported to FRA 2005:                      1990    2000    2005

### Sources

- [Global FRA 2005 Country Report 215: Switzerland. FAO – Forestry Department, Rome 2005](#)
- [State of Europe's Forests 2003. The MCPFE Report on Sustainable Forest Management in Europe. MCPFE Liaison Unit Vienna and UNECE/FAO 2003](#)

Productive Plantation Forests area was compiled in the database. A planting/seeding rate reported in literature was applied to the area of Semi-Natural Forests area to extract the planted component. The Planted Semi-Natural Forests area was then divided into productive/protective by applying the same ratio reported for Plantation Forests

Planting/seeding rate of total generation types

<b>1990-2000-2005<sup>(1)</sup></b>
<b>4.2%</b>

<sup>(1)</sup>Assumed to be the same for years 1990, 2000 and 2005

Semi-Natural Forests area reported to FRA 2005 (1 000 ha)

1990	2000	2005
1,146	1,182	1,188

Plantation Forests area reported to FRA 2005 (1 000 ha)

1990		2000		2005	
Productive	Protective	Productive	Protective	Productive	Protective
3	0	4	0	4	0

### **3.3 Countries reporting Semi-Natural Forest area to FRA 2005**

#### **Germany**

Forest categories reported to FRA 2005      Semi-Natural Forests  
 Years reported to FRA 2005:                      1990   2000   2005

Sources

- [Global FRA 2005 Country Report 168: Germany. FAO – Forestry Department, Rome 2005](#)
- [State of Europe's Forests 2003. The MCPFE Report on Sustainable Forest Management in Europe. MCPFE Liaison Unit Vienna and UNECE/FAO 2003](#)

A planting/seeding rate reported in literature was applied to the area of Semi-Natural Forests to extract the planted component. The Planted Semi-Natural Forests area was divided into productive/protective according to an average ratio of the neighbouring countries: Austria, Switzerland, France, Netherlands and Poland.

Planting/seeding rate of total generation types

<b>1990-2000-2005<sup>(1)</sup></b>
<b>60.0 %</b>

<sup>(1)</sup>Assumed to be the same for years 1990, 2000 and 2005

Semi-Natural Forests area reported to FRA 2005 (1 000 ha)

1990	2000	2005 <sup>(1)</sup>
10,741	11,076	11,076

<sup>(1)</sup>Figures reported from year 2000

### **3.4 Countries that reported to FRA 2000 but that were unable to report to FRA 2005**

The Desk Study included also Cameroon, Congo DPR and Venezuela, three countries that had previously reported Plantation Forests to FRA 2000 but were unable to report to FRA 2005. Because of their location in tropical zones and their area previously submitted to FRA

2000, the study focused on reporting on Plantation Forests, productive and protective, and not on Semi-Natural Forests which tend to be reported more in non tropical zones.

**Cameroon**

Forest categories reported to FRA 2000      Plantation Forests  
 Years reported to FRA 2000:                      2000

Sources

- [FAO 2001. FRA 2000 Main Report. FAO Forestry Paper 140. Rome](#)

Plantation Forests area reported at year 2000 was extrapolated at years 1990 and 2005. The ratio of productive/protective was derived by the breakdown of industrial/non-industrial as reported by FRA 2000 and assumed constant for the three years.

Plantation Forests area reported to FRA 2000 (1 000 ha)

<b>2000</b>	
<b>Industrial</b>	<b>Non-Industrial</b>
9.2	71

**Congo DPR**

Forest categories reported to FRA 2000      Plantation Forests  
 Years reported to FRA 2000:                      2000

Sources

- [FAO 2001. FRA 2000 Main Report. FAO Forestry Paper 140. Rome](#)

Plantation Forests area reported at year 2000 was extrapolated at years 1990 and 2005. The ratio of productive/protective was derived by the breakdown of industrial/non-industrial as reported by FRA 2000 and assumed constant for the three years.

Plantation Forests area reported to FRA 2000 (1 000 ha)

<b>2000</b>	
<b>Industrial</b>	<b>Non-Industrial</b>
68	29

**Venezuela**

Forest categories reported to FRA 2000      Plantation Forests  
 Years reported to FRA 2000:                      2000

Sources

- [FAO 2001. FRA 2000 Main Report. FAO Forestry Paper 140. Rome](#)

Plantation Forests area reported at year 2000 was extrapolated at years 1990 and 2005. The ratio of productive/protective was derived by the breakdown of industrial/non-industrial as reported by FRA 2000 and assumed constant for the three years.

Plantation Forests area reported to FRA 2000 (1 000 ha)

2000	
Industrial	Non-Industrial
836	27

### 3.4 Countries not reporting Plantation Forests or Semi-Natural Forests to FRA 2000 or FRA 2005

#### Canada

Canada, with a Total Forest area of 310 million hectares, is among the most relevant countries on forests in the world. For more than two decades, Canada has been undertaking a reforestation programme to enhance natural regeneration in harvested forests by planting or seeding endemic species. Canada was unable to report areas of Plantation Forests or Semi-Natural Forests to FRA 2000 and FRA 2005. Therefore a search of available literature was undertaken to estimate the area of forests regenerated by planting or seeding that, according to FAO definitions, should be classified as Planted Semi-Natural Forests<sup>1</sup> - a type of Planted Forest.

#### Sources

The sources collected for the study are available on the [Canadian Forest Service](#) web site and refer to a set of reports on the State of Canada's Forests from 1994 to 2006.

- [The state of Canada's Forests 2005-2006](#)
- [The state of Canada's Forests 2004-2005](#)
- [The state of Canada's Forests 2003-2004](#)
- [The state of Canada's Forests 2002-2003](#)
- [The state of Canada's Forests 2001-2002](#)
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- [The state of Canada's Forests 1997-1998](#)
- [The state of Canada's Forests 1996-1997](#)
- [The state of Canada's Forests 1995-1996](#)
- [The state of Canada's Forests 1994-1995](#)

Statistical data extracted from the State of Canada's Forest Reports were compiled to build an indicative history of the area planted or seeded over the last 25 years in Canada. The planted area considered did not include any reduction factor due to insect pest, fires and climate adversities and was entirely considered as total area planted. It was assumed that 100 percent was grown for productive purposes.

Semi-Natural Forests area extracted and averaged from Canada's reports (1 000 ha)

1990		2000		2005	
Productive	Protective	Productive	Protective	Productive	Protective
3,976	0	8,147	0	10,206	0

<sup>1</sup> According to the definitions (Working Paper FP/35) the planted component of Semi-Natural forests is composed by "Forest of native species, established through planting, seeding, coppice"

## **4.0 Results and Analysis**

The results and analysis of the 36 country responses to the questionnaire (Working Paper FP/35a) and the desk study for these additional 25 countries (Working Paper FP/35b) are reported the Global Planted Forests Thematic: Results and Analysis (Working Paper FP/38)

## Annex 1: FAO Working Paper series on planted forests

*Note:* In code “Working Paper FP/x”, “x” indicates the WP series number and a suffix E, F or S indicates: E = English, F = French, S = Spanish, in case of multilingual papers. No suffix indicates English only.

**Available at the Planted Forest Web site: [www.fao.org/forestry/site/10368/en](http://www.fao.org/forestry/site/10368/en).**

- Working Paper FP/1: *Mean Annual Volume Increment of Selected Industrial Species.* Ugalde L. and Perez O. April 2001.
- Working Paper FP/2: *Biological Sustainability of Productivity in Successive Rotations.* Evans J. March 2001.
- Working Paper FP/3: *Plantation Productivity.* Libby W.J. March 2001.
- Working Paper FP/4: *Promotion of Valuable Hardwood Plantations in the Tropics. A Global Overview.* Odoom F.K. March 2001.
- Working Paper FP/5: *Plantations and Wood Energy.* Mead D.J. March 2001.
- Working Paper FP/6: *Non-Forest Tree Plantations.* Killmann W. March 2001.
- Working Paper FP/7: *Role of Plantations as Substitutes for Natural Forests in Wood Supply – Lessons learned from the Asia-Pacific Region.* Waggener T. March 2001.
- Working Paper FP/8: *Financial and Other Incentives for Plantation Establishment.* Williams J. March 2001.
- Working Paper FP/9: *Impact of Forest Policies and Legislation on Forest Plantations.* Perley C.J.K. March 2001.
- Working Paper FP/10: *Protecting Plantations from Pests and Diseases.* Ciesla W.M. March 2001.
- Working Paper FP/11: *Forestry Out-Grower Schemes: A Global View.* Race D. and Desmond H. March 2001.
- Working Paper FP/12: *Plantations and Greenhouse Gas Mitigation: A Short Review.* Moura-Costa P. and Aukland L. March 2001.
- Working Paper FP/13: *Future Production from Forest Plantations.* Brown C. March 2001.
- Working Paper FP/14: *Forest Plantation Resources, FAO Data Sets 1980, 1990, 1995 and 2000.* Del Lungo, A. December 2001
- Working Paper FP/15: *Global Forest Plantation Development: Review for FRA 2000.* Vuorinen A.P. and Carle, J.B. April 2002
- Working Paper FP/16S: *Bibliografía Anotada Sobre los Efectos Ambientales, Sociales y Económicos de los Eucaliptos.* Compilación de documentos elaborados en inglés, francés y español entre 1985 y 1994. Marzo de 2002.
- Working Paper FP/16E: *Annotated Bibliography on Environmental, Social and Economic Impacts of Eucalyptus.* Compilation from English, French and Spanish Literature, 1985 to 1994. Revised (Combined) Edition, March 2002.
- Working Paper FP/17S: *Bibliografía Anotada Sobre los Efectos Ambientales, Sociales y Económicos de los Eucaliptos.* Compilación de documentos elaborados en inglés, francés y español entre 1995 y 1999. Palmberg C., Marzo de 2002.

- Working Paper FP/17E *Annotated Bibliography on Environmental, Social and Economic Impacts of Eucalyptus*. Compilation from English, French and Spanish Literature, 1995 to 1999. Palmberg C., March 2002.
- Working Paper FP/18 *Tropical forest plantation areas 1995 data set*. Pandey D. May 2002.
- Working Paper FP/19 *Teak (Tectona grandis) in Central America*. De Camino, R.V., Alfaro, M.M. and Sage, L.F.M. May 2002.
- Working Paper FP/20 *Melina (Gmelina arborea) in Central America*. Alfaro, M.M. and De Camino, R.V. May 2002.
- Working Paper FP/21 *Case study of hardwood programmes in Fiji, Solomon Islands and Papua New Guinea*. Hammond, D. May 2002.
- Working Paper FP/22 *Case study of long rotation eucalypt plantations in New South Wales*. Heathcote, R. June 2002.
- Working Paper FP/23 *Case study of the tropical forest plantations of Malaysia*. Krishnapillay, D.B. June 2002.
- Working Paper FP/24 *Hardwood plantations in Ghana*. Odoom, F. June 2002.
- Working Paper FP/25 *Planted Forests Database (PFDB): Structure and Contents*. Varmola, M. and Del Lungo, A. July 2003.
- Working Paper FP/26 *Planted Forest Database: Analysis of Annual Planting Trends and Silvicultural Parameters for Commonly Planted Species*. Del Lungo, A. September 2003.
- Working Paper FP/27E *Role of Planted Forests and Trees Outside Forests in Sustainable Forest Management: Republic of Tunisia - Country Case Study*. Rouchiche, S. and Abid, H. October 2003.
- Working Paper FP/27F *Rôle des Plantations Forestières et des arbres hors forêts dans l'aménagement forestier durable: République de Tunisie - Rapport par pays*. Rouchiche, S. and Abid, H. October 2003.
- Working Paper FP/28E *Role of Planted Forests and Trees Outside Forests in Sustainable Forest Management: Republic of Mali - Country Case Study*. Thomas, I. and Samassekou, S. October 2003.
- Working Paper FP/28F *Rôle des Plantations Forestières et des arbres hors forêts dans l'aménagement forestier durable: République du Mali - Rapport par pays*. Thomas, I. and Samassekou, S. October 2003.
- Working Paper FP/29E *Role of Planted Forests and Trees Outside Forests in Sustainable Forest Management: Republic of Ethiopia - Country Case Study*. Thomas, I. and Bekele, M. October 2003.
- Working Paper FP/29F *Rôle des Plantations Forestières et des arbres hors forêts dans l'aménagement forestier durable: République d'Éthiopie - Rapport par pays*. I. Thomas et M. Bekele. October 2003.
- Working Paper FP/30E *Role of Planted Forests and Trees Outside Forests in Sustainable Forest Management: Republic of Namibia - Country Case Study*. Thomas, I. and Chakanga, M. October 2003.
- Working Paper FP/30F *Rôle des Plantations Forestières et des arbres hors forêts dans l'aménagement forestier durable: République de Namibie - Rapport par pays*. I. Thomas et M. Chakanga. October 2003.
- Working Paper FP/31E *Role of Planted Forests and Trees Outside Forests in Sustainable Forest Management: Sultanate of Oman - Country Case Study*. Rouchiche, S. October 2003.

- Working Paper FP/31F *Rôle des Plantations Forestières et des arbres hors forêts dans l'aménagement forestier durable: Sultanat d'Oman - Rapport par pays.* S. Rouchiche. October 2003.
- Working Paper FP/32E *Role of Planted Forests and Trees Outside Forests in Sustainable Forest Management: Islamic Republic of Iran - Country Case Study.* Rouchiche, S. and Haji Mirsadeghi, M. A. October 2003.
- Working Paper FP/32F *Rôle des Plantations Forestières et des arbres hors forêts dans l'aménagement forestier durable: République Islamique d'Iran - Rapport par pays.* S. Rouchiche. October 2003.
- Working Paper FP/33 *Potential for Fast-Growing Commercial Forest Plantations to Supply High Value Roundwood.* R. James and A. Del Lungo. February 2005.
- Working Paper FP/34 *Netherlands Trust Fund Support to Sustainable Forest Management in Low Forest Cover Countries. - the Role of Planted Forests and Trees Outside Forests in Landscape Restoration in Low Forest Cover Countries.*
- Working Paper FP/35E *Global Planted Forests Thematic Supplement to Forest Resources Assessment 2005. - Guidelines for National Reporting Tables for Planted Forests.* A. Del Lungo and J. Carle. April 2005.
- Working Paper FP/35F *Supplément thématique sur les forêts plantées à l'Évaluation des ressources forestières 2005. - Directives pour l'élaboration des tableaux nationaux d'information sur les forêts plantées.* A. Del Lungo et J. Carle. Avril de 2005.
- Working Paper FP/35S *Suplemento temático sobre los Bosques plantados de la Evaluación de los Recursos Forestales 2005. - Directrices para la elaboración de las tablas informativas nacionales sobre los bosques plantados.* A. Del Lungo y J. Carle. Abril de 2005.
- Working Paper FP/35aE *Global planted forests thematic: country responses to reporting tables for planted forests survey.* A. Del Lungo and J. Ball, 2006.
- Working Paper FP/35bE *Global planted forests thematic: supplementary desk study on planted forests.* A. Del Lungo and J. Ball, 2006.
- Working Paper FP/36E *Management of wood properties in Planted Forests. A paradigm for global forest production.* R. Jagels. June 2006.
- Working Paper FP/37aE *Responsible Management of Planted Forests: Voluntary Guidelines – Volume A: Principles and Guidelines.* Forest Resources Development Service, FAO, December, 2006
- Working Paper FP/37bE *Responsible Management of Planted Forests: Voluntary Guidelines – Volume B: Implementation Considerations.* Forest Resources Development Service, FAO, December, 2006
- Working Paper FP/37/cE *Responsible Management of Planted Forests: Voluntary Guidelines – Volume C: Annexes.* Forest Resources Development Service, FAO, December, 2006
- Working Paper FP/38E *Global planted forests thematic: results and analysis.* A. Del Lungo, J. Ball, J. Carle, December, 2006.