

# Flanders

Beatrijs Van der Aa and Jos Van Slycken

## 1. Forest characteristics

### Forest cover and species composition

The total forest area of Flanders is 150,000 hectares, with an 11% forestation index. 50% of these forest areas are broadleaved forests, 36% coniferous forests and of 11% mixed forests.



territory: 13,500 km<sup>2</sup>,  
population: 6.2 million,  
capital city: Brussels.

The area for reforestation is approximately 0.6% and open areas within the forest cover constitute 1.7%. The distribution of different forest types in Flanders is presented in Fig. 1. (Source: Forest inventory 2000).

66% of the forests in Flanders have a tree cover  $>2/3$ , 26% – between  $1/3$  and  $2/3$ , and 6%  $<1/3$ . The high percentage of forests with a cover  $>2/3$  can be explained by the high share of young forests (the age of 55% of the forests in Flanders is below 40 years) (Forest inventory 2000).

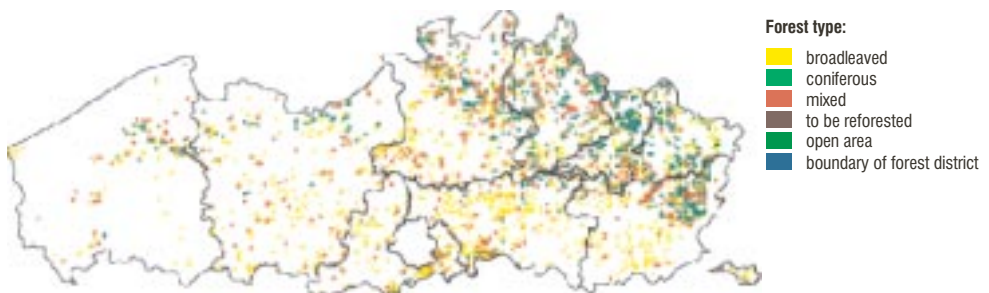


Fig. 1. Distribution of different forest types in Flanders (Source: Forest inventory 2000)



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## Volume and increment

The total standing volume in the Flemish forests consists of 46% of softwood, 16% of poplar and 38% of other hardwood species (of which 5% constitutes American red oak) (NARA 2003).

The total standing volume in Flanders is 31,584,000 m<sup>3</sup>, i.e. 216 m<sup>3</sup>/ha on average. Scots pine, constituting 28%, has the largest share of standing volume (Fig. 2). This is followed by poplar, with 16%. For forests based on these two species, forestry policy stimulates conversion by, for instance, lower (or no) subsidies for afforestation with both these species. In the future, their share is expected to decrease, which will affect supplies to the timber processing sector.

As regards age distribution, conifers have the major share in the age classes 21–40 years and 41–60 years, in contrast to the age class 0–20 years. The current share of exotic species in standing volume is 39%. The management objective for public forests is a reduction in the share of exotic species to 20%.

Recent data on the annual increment in Flanders is presently not available, which makes it very difficult to assess the ratio of annual harvest to annual increment. According to the Management Vision of the Forests and Green Areas Division, the mean annual increment for all forests in Flanders is estimated at 5 m<sup>3</sup>/ha; this figure would be even higher for public forests.

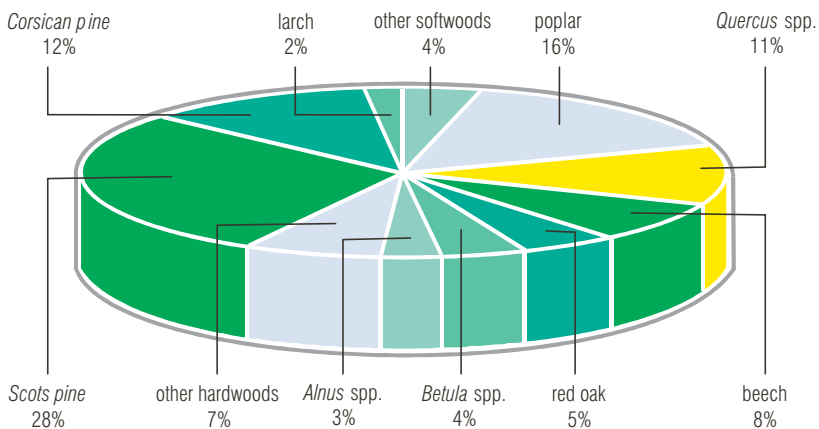


Fig. 2. Distribution of standing volume by species (Source: AMINAL, Forests and Green Areas Division, NARA 2003)

## 2. Logging and wood processing

Data on the annual wood harvest is only available for public forests and forest owners groups, which means that information is unavailable on wood harvested in more than half of the forest areas.

As regards the volume of wood sold from public forests and forest owners groups, a trend towards increasing volumes has been recorded. This trend is not necessarily the result of more intensive harvesting. Other factors are:

- the increase in the forest area managed by the Forest and Green Area Division;
- the Forests and Green Areas Division including under public sales wood that originated in areas administered by the Nature Division. This wood is a by-product of nature conservation management, e.g. deforestation for restoration of species-rich grasslands, etc.

In 2004, just over 90,000 m<sup>3</sup> of wood was sold from state-owned forests, 44,000 m<sup>3</sup> came from other public forests and 33,000 m<sup>3</sup> from the forest groups, a total of 167,000 m<sup>3</sup>.

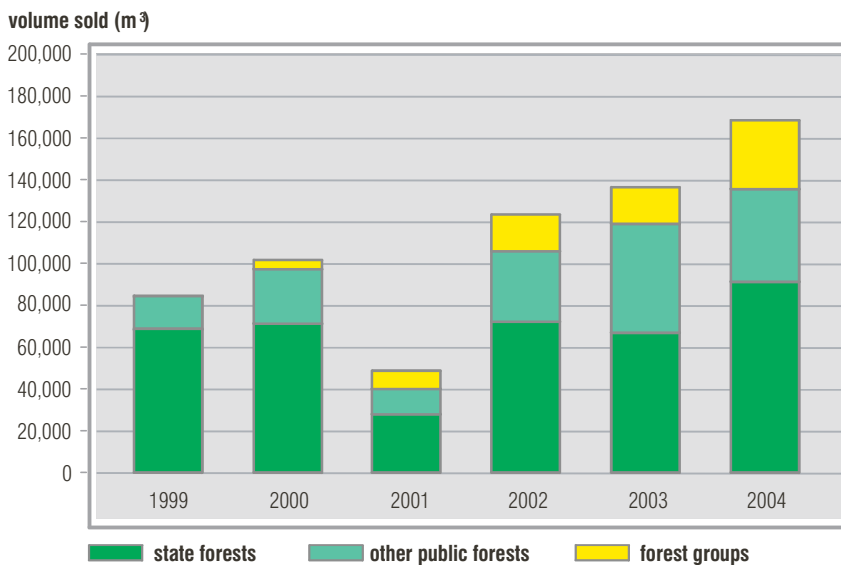


Fig. 3. Evolution of wood sales (in m<sup>3</sup>/year) from public forests (state-owned forests and other public forests) and forest owners groups (Source: Forests and Green Areas Division, NARA 2005)

Converting the figures for public forests into m<sup>3</sup>/ha, the total annual wood harvest in 2004 amounted to 3.7 m<sup>3</sup>/ha, which is approximately comparable with the figures for neighbouring countries (Fig. 4). Thus it may be said that in Flanders too, the annual increment is significantly higher than the annual harvest.

Forest exploitation is mostly carried out manually by means of power tools (saws), whereas the logs are extracted by means of machinery (tractors). Due to a low level of investment, most of the harvesting operations are carried out by means of these too heavy tractors. However, increasing use has recently been made of fully mechanised harvesting machines (harvesters and forwarders), which are capable of felling, lopping, debarking and sawing, thus allowing for quick and economical operations.

Approximately 8 such harvesters are presently in operation in Flanders. This number will probably increase similarly as in neighbouring countries. (NARA 2005).

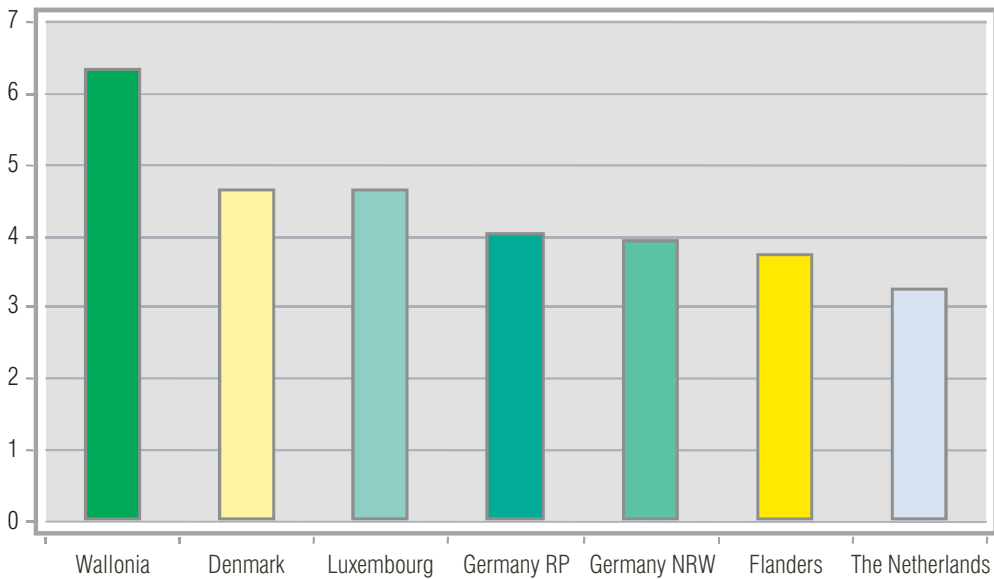
annual wood harvest in m<sup>3</sup>/ha

Fig. 4. Comparison of the annual wood harvest in m<sup>3</sup>/ha in Flanders and neighbouring regions/countries (Source: European Forest Institute)

### 3. Forest protection

Wood production is not given the same priority throughout the Flemish forests and is variously categorised under specific regulations, which may or may not limit the wood harvest within a specific category.

No wood harvesting is carried out in nature reserves. The situation is presently not too clear for forests within the Flemish Ecological Network (VEN), as nature management plans have still to be developed. Forests situated in the VEN may be subject to the restrictions imposed by the nature management plans, which will probably aim at a reduction of wood harvesting (e.g. aiming at an increase in dead wood volume). Wood production will in any case be a secondary priority in these forests, since nature conservation and nature development issues are the primary objectives for these areas.

It should also be noted that those forest sites that lie within the area of the Habitats Directive and which are not designated as reserves or not covered by the VEN, are included in that 65% of the forest area where wood production is a secondary priority. Indeed, restrictions can be imposed in these areas to protect habitats considered of international importance.

However, in those forest areas resulting from afforestation of agricultural land, wood production is the primary function, although these forests constitute only a very small (0.5%) share of the total forest area.

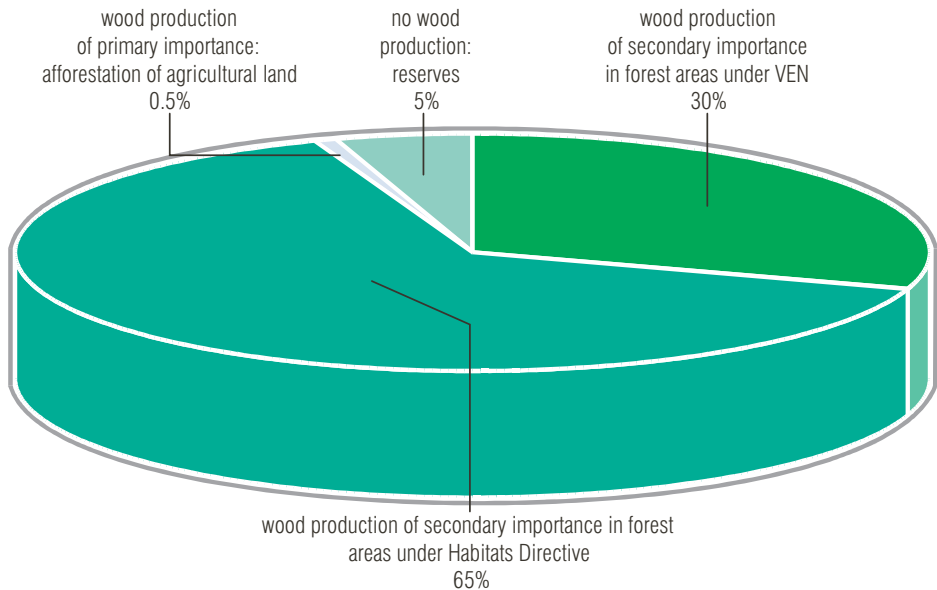


Fig. 5. Priorities of wood production in the forest areas of Flanders (Source: Leyman & Vandekerckhove, 2002; NARA 2003)

#### 4. Legal and organisational aspects of forest holdings

In Flanders, there are approximately 150,000 hectares of forest area, 75% of which constitutes the property of approximately 100,000 private owners (1.5 ha per owner).

55% of forests have forest roads, 19% are provided with tourist information boards, 17% feature lakes and ponds for fishing, 13% of woodland have benches, 13% – sunbathing areas and playgrounds, and 11% – carparks.

Another positive finding is the absence of garbage in 77% of forests. In addition, 79% show no soil compaction beyond designated forest tracks. Problems concerning these two issues were found in only 5% and 4% of forests, respectively.

Recreational facilities are reasonably evenly distributed over the various forest types (broadleaved, coniferous and mixed forests).

Exceptions are the high share of broadleaved forests with sunbathing areas and playgrounds (18%), fishponds (25%) and fencing (33%), compared to coniferous forests (with sunbathing areas and playgrounds 7%, fishponds 9% and fencing 18%) followed by mixed forests (with sunbathing areas and playgrounds 9%, fishponds 12% and fencing 24%).

The first regional forest inventory in Flanders assessed the availability of recreational infrastructure in combination with any possible negative effects from recreation, such as garbage and soil compaction beyond forest tracks.

## Forest law

Since 1991, a new Forest Act has been in force in Flanders, this applying to the environmental, ecological, social, scientific and productive functions of all forests (private and public).

The following Regulations concern the implementation of sustainable forest management:

- BVR 08/12/2002 (BS 18/12/2002) on the recognition of wood buyers and forest operators;
- BVR 27/06/2003 (BS 10/09/2003) on forest management plans;
- BVR 27/06/2003 (BS 10/09/2003) on the establishment of criteria for sustainable forest management in the Flemish Region;
- BVR 27/06/2003 (BS 10/09/2003) on the provision of subsidies for management of public and private forests;
- BVR 27/06/2003 (BS 10/09/2003) on the recognition and subsidising of forest groups and co-operation between the forest authorities and forest groups (NARA 2005).

The Flemish Government supports forest protection and sustainable forest management on a global scale by:

- Managing its own wood production;
- Entering into international co-operation on forest protection and sustainable forest management;
- Promoting the use of certified wood (FSC).

In 2002, the Flemish Government set up the Flemish Fund for Tropical Forest (VFTB), which in 2002 founded 9 and in 2003 subsequent 10 small-scale sustainable forest management projects in several developing nations ([www.groenhart.be](http://www.groenhart.be); NARA 2005).

## 5. Structure and tasks of the regional forest administration

In Flanders, forests are administered by the Forests and Green Areas Division (Afdeling Bos en Groen). This Division and the Nature Division are parts of the Administration of Environment, Nature, Land and Water Management (AMINAL). They are subordinated to the Minister of the Environment. The responsibilities of the Forests and Green Areas Division are much broader than mere management of state-owned forests. It is also responsible for the management of parks and other public green areas, inland fisheries, game management and bird protection. Conservation of the existing forest areas is the main task of the forest service. Forest management in Flanders is aimed at expanding the existing forest areas by 10,000 hectares. In addition, afforestation of 10,000 hectares of former agricultural land is also planned. Under these main tasks, priorities in Flanders are improvements in both the natural environmental and living conditions for urban and industrial populations. For this reason, the Division strives to ensure an integrated and sustainable combination of recreational, landscape, economic and ecological roles for all forests, whether in urban or rural areas.

The Forests and Green Areas Division is responsible for technical management of state-owned and other public forests (marking for thinning, inventories). It is also responsible for supervising management of private forests (approval of management plans, felling permits, subsidies). The Division employs a staff of approximately 400.

### Private owners associations

Due to the fragmented nature of forest ownership, groups of private forest owners (forest groups) have been established. These forest owners associations oversee voluntary co-operation between the large number of private forest owners and public forest managers. Their objective is implementation of improved and more coherent forest management practices. The above-mentioned Regulation on recognition of forest groups came into force in 2003 and the current pilot projects are now under the management of these independent, recognised forest owners groups.

Since January 2004, two forest owners groups have been provisionally approved for a period of three years. Beginning in January 2005, another 5 forest owners groups were to commence operations. In order to provide forest owners throughout the whole Flemish territory the opportunity to obtain support from these forest groups, new pilot projects will be started in the near future. Ultimately, the Forests and Green Areas Division expects that a regional network of 19 forest groups will cover the whole territory by 2006. The forest groups which are already recognised and have commenced operations represent approximately 15,000 forest owners, who are kept informed about the practical aspects of forest management, the relevant legislation and the activities of other forest groups. This number of forest owners currently manage a total of approximately 12,859 hectares of forests which constitutes 22% of the total forest area of operations of the forest groups (Fig. 6).

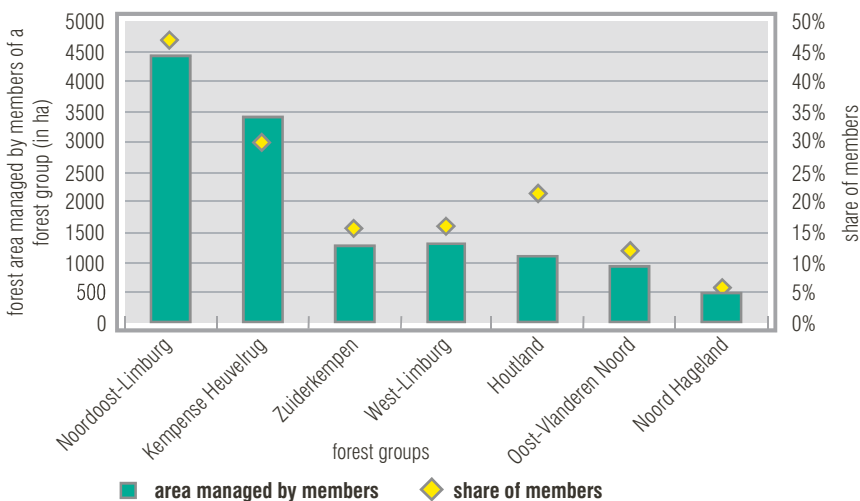


Fig. 6. The area managed by members of forest groups and the share of members of forest groups (Source: AMINAL, Forests and Green Area Division)

## 6. Education in forestry

### Technical schools

There are no secondary or technical schools to provide an exclusively forestry related-education; however, certain technical schools offer education in the field of Green Management. Besides these technical schools, the most professional education in forestry is provided by the Inverde vzw Centre, which was established in March 1992 by the Flemish Community, as well as by two other non-governmental organisations, the Association for Forests in Flanders (Vereniging voor Bos in Vlaanderen) and the Centre for Private Forestry (Centrum voor Privé-bosbouw).

The 'Inverde vzw' Centre conducts a broad range of field work addressing both the forestry sector and the general public, by means of:

- specific and specialised training, additional training and retraining of officials (higher officials, foresters, nature protection rangers);
- specific and specialised training, additional training and retraining of people employed in the forestry sector;
- information, training and guidance for private forest-owners;
- general forestry information and education for the general public;
- supporting the exchange of know-how between private owners, the organisers and owners of the chain of wood supplies and the administrative authorities.

At regular intervals, the 'Inverde vzw' Centre runs technical, non-university level courses. These can be both theoretical and/or practical and cover all issues related to forests and forest-management, such as recognition of (indigenous) tree species, close-to-nature forestry, dendrology, marking for thinning, and forest-inventory. The 'forestry skills' course combines all these subjects. This course includes the bulk of the required subject matter for people intending to become forest or nature protection rangers in the Flemish Community. The Centre's courses, such as the series of courses for forestry workers and training-courses in chainsaw, brush cutter and tractor operation, are mostly practically oriented. Besides the above-mentioned courses, workshops and campaigns are organised for the two non-governmental organisations that co-founded the Centre. These involve several activities a year, often with hundreds of participants in attendance.

### University education

Forestry education at university level (Bachelor's and Master's degrees) is offered by two Universities, namely the **University of Gent**, in its Forest and Water Management Department at the Faculty of Bioscience Engineering, and the **Catholic University of Leuven**, in its Department of Land Management at the Faculty of Applied Bioscience and Engineering.

The Faculty of Bioscience Engineering (University of Gent, Forests and Water Management Department) consists of 4 divisions:



- Forestry Laboratory,
- Forest Management and Spatial Information Techniques Laboratory,
- Wood Biology and Technology Laboratory,
- Hydrology and Water Management Laboratory.

At the Forestry Laboratory, three research teams specialise in various aspects of forest ecology and forest policy, and collaborate on integrating their knowledge in various forestry applications. This Laboratory's expertise, gained over the last 30 years, is currently being applied in forest conversion, afforestation of polluted sites, close-to-nature forest management, short-rotation forestry and private forest owners' participation.

At the Forest Management and Spatial Information Techniques Laboratory, the courses provided include:

- Dendrology and Forest Inventory,
- Forest Management Planning,
- Remote Sensing,
- Tropical Forestry,
- GIS-Basics and GIS-Vegetation Applications.

The Wood Biology and Technology Laboratory specialises in:

- Forest exploitation,
- Wood anatomy and identification,
- Material properties of wood,
- Processing of wood and its final products.

The Forest, Nature and Landscape Research Laboratory at the Catholic University of Leuven focuses on the following fields of research:

- Methods and rate of plant dispersal in nature and relevant knowledge within the framework of forest expansion, nature development and restoration;
- The anthropogenic impact on landscapes and evaluation methods for the same;
- The social, ecological, and economic functions of landscapes;
- The use of satellite-imagery in order to obtain useful information about the growth and the vitality of natural ecosystems;
- Carbon dioxide absorption by forests and their contribution to reducing the greenhouse effect;
- Acquisition and processing of ecosystems data in geographic information systems;
- Development of measurement methods and indicators for sustainable forest management.

Subjects currently covered include: criteria and indicators for sustainable forest management, indicators of tree architecture, life cycle assessment, land-use impact assessment, water balance, energy analysis, carbon sequestration and mitigation of greenhouse effect, decision supporting systems, ecology of dry land forests.

## 7. Forest research

### The Institute for Forestry and Game Management

The sole government forest research establishment in Flanders, the Institute for Forestry and Game Management (IBW-IFG), was founded on March 13th 1991 as a scientific research institute of the Flemish Community. It incorporates the former Government Poplar Research Station (Geraardsbergen) founded in 1948 as a private research station of the Swedish Match Company, and the Government Research Station for Silviculture and Hydrobiology (Groenendaal-Hoeilaart) founded in 1896. The basic mission of the Institute is to organise scientific, policy-oriented research and provide scientific advice to forestry, inland fisheries and game management, the latter including exotic and expansive species.

The Institute consists of a Forestry Division and a Game Management Division. Forest and forestry research focuses on the following fields:

- Forest ecology and forest development: methodological and ecological research in forest reserves, monitoring of natural processes in strict forests reserves, forest management research oriented towards natural regeneration and transformation of homogeneous and even-aged forests, biodiversity;
- Conservation and use of forest genetic resources: conservation of genetic resources for endangered tree species, study of genetic diversity, selection and production of valuable forest reproductive material, phytopathological support for reproduction and selection programmes, molecular genetics with regard to reproduction and conservation of genetic diversity;
- Site research: research on the habitat requirements of tree species and forest types, soil restoration, soil contamination, techniques for afforestation and reforestation, mineral and hydrological cycling in forest ecosystems, socio-economic aspects of afforestation of agricultural land;
- Forest protection: monitoring of forest health, study of biotic and abiotic stresses, influence of long-range, transboundary air pollution on forest ecosystems, intensive monitoring of air pollution in forests;
- Wood technology and wood quality: evaluating the wood quality of selected forest reproductive materials, the inheritability of wood properties, wood properties in relation to changes in forest policy, wood chains;
- Selection and reproduction of poplar.

Additionally, in collaboration with forest administration, the Institute plays a leading role in the International UN Co-operative Programme on Forests, runs the Forest Soil Co-ordinating Centre with the EU support and is involved in several related working parties. The Forestry Division also participates in several EU funded research projects.

The Institute also manages nurseries, seed orchards, container-based nurseries, laboratories for soil and water analysis, pathological and molecular analysis laboratories, *in vitro* facilities, a measuring tower for air pollution effects on forests, GIS and GPS facilities and a library. The research results are disseminated through publications in national and international scientific journals, at seminars, meetings, and study tours, but also through its

Table 1. Funding structure for forest-related research (2003)

<b>Total annual amount of funding for forest research</b>	<b>EUR 4,697,000</b>
<b>Forest research funding is shared between:</b>	
Regional public funding	EUR 3,841,000
External funding	EUR 428,000
<b>External funding includes:</b>	
EU funding	EUR 109,000
Other sources	EUR 319,000

own channels: scientific reports, an annual activity report, a newsletter and its website ([www.ibw.lin.vlaanderen.be](http://www.ibw.lin.vlaanderen.be)).

The research is conducted by a staff of 59 (researchers are required to have an academic, M.Sc. or equivalent, or higher degree), including 35 directly responsible for forestry issues, 22 of which have a degree in forestry, while 13 have degrees in other disciplines (biology, geology, biometry). They are technically assisted by a further staff of 62, of which 47 are involved in forestry research. Sources of research financing are presented in Table 1.

A process of improving administrative policy is currently underway. This includes preparation of a merger between the two Flemish Scientific Institutes, with a view to handling environmental, natural and energy-related policies and establishing the Institute for Nature and Forestry Research (INBO), this being a joint research programme that has already been drawn up for 2005. The major directions of its forestry research are outlined below.

The Policy Memorandum on the Environment and Nature 2004–2009 emphasises correct and prompt implementation of European and international commitments. Flanders has assumed important obligations with regard to submitting reports concerning implementation of international legal instruments, such as EU Directives and International Conventions and Treaties. The INBO's role in the fulfilment of these obligations will be to provide scientific support and advice.

Within its strategic objectives, the INBO shall respond to the new needs ensuing from European and worldwide developments with regard to biodiversity, the environment, energy demand, climate and related policies. To summarise, these new initiatives concentrate on three issues: (1) stricter biological monitoring, (2) sustainable use of biodiversity and open areas, and (3) climate change resulting from the greenhouse effect.

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## Wallonia

Antonina Arkuszewska

### 1. Forest characteristics

Since 1866, the area of forests in the Walloon Region has systematically increased from 315,648 hectares to 468,889 hectares. Stand conversion from coppices to standard and the replacing of weak broadleaved stands of coniferous forest has been even more rapid (Table 1).

Earlier statistics unfortunately did not provide any detailed information on broadleaved stands. The share of coniferous species in 1984, excluding Christmas tree plantations, which are treated as cultivation, is presented in Table 2.



territory: 16,800 km<sup>2</sup>,  
population: 3.8 million,  
capital city: Namur.

Table 1. Changes in forest categories during the past century

Forest category	1895	1929	1984
High broadleaved forest	40,638	49,471	101,778
High broadleaved forest with coppices in the second storey	189,677	166,605	99,701
Coppice forest	104,724	84,988	37,757
<b>Total broadleaved forests</b>	<b>335,040</b>	<b>301,064</b>	<b>239,236</b>
Coniferous forests	55,935	135,777	247,653
<b>Grand total of forest area</b>	<b>390,975</b>	<b>436,841</b>	<b>486,889</b>