

Potential further development of forestry in Ireland – some observations from outside

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Preliminary remarks

The launch of *Broadleaf Forestry in Ireland* in late October 2016 presented an opportunity to reflect on the potential further development of forestry in Ireland. These are some thoughts and observations compiled because of my recent visit to Ireland.

Forestry in Ireland – historical perspective

History of forestry in Ireland

Approximately 1% of the originally extensive natural broadleaf-dominated forest cover was left in Ireland by 1900. Recognising this severe decline, and to meet the timber needs of the population, an extensive state programme of afforestation soon commenced which gained momentum, particularly after the two world wars. This programme resulted in the planting of predominantly exotic conifers and mainly on poorer sites. This was the result of a very low ceiling which was set on the price which the State would pay for forestry land to ensure that no land suitable for agriculture would be planted. Thus, over this period, state forests of about 400,000 ha or 6% of the state's area were established and have now facilitated the creation of a developing softwood timber market and a new wood industry. Since the 1990s, grants have been provided mainly to address the requirements for various agricultural products within Europe, including Ireland, and were designed to promote afforestation with broadleaves, partly to compensate for the predominance of the coniferous forests and partly because the sites which were by then becoming available in the private sector were of much better quality. Some 200,000 ha of pure broadleaf and mixed forests were established, and this was almost entirely privately-owned farm land. Thus, since the mid-1990s, a mainly private forestry sector has developed.

Natural preconditions

Ireland has a mild, moist oceanic climate, and although the climatic conditions vary considerably between the western and eastern part of the country, as well as between south and north, good forest growth is possible almost everywhere in the

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country. However, many of the sites in the lowlands are suitable for broadleaf species. Broadleaves in general are much more site demanding than most conifers and require a high level of soil fertility. Nevertheless, there are larger areas where mixed forests of conifers with broadleaves can be established.

Current situation

Ireland is in a good position in having extensive data to describe its national forest resources (National Forest Inventory – NFI 2007-2013) and, as mentioned, the conifer timber market is well-developed. Broadleaf timber, however, is still of minor importance, mainly because the majority of stands are still quite young, but they will gain significance as they age. The role of forests in nature conservation and recreation has also attained increasing public attention.

Silvicultural strategies and procedures for growing broadleaf forests (regeneration, thinnings, diminishing risks) are at a reasonable standard of development and most of these new broadleaf forests are at the earlier stages of management.

Options and demands concerning future development

Irish forestry will be increasingly influenced by external – worldwide – trends. Nevertheless, internal influences will likewise be important. Both aspects are discussed below.

Prerequisites for future development of Irish forestry

Forestry worldwide is confronted with some major issues which will gain increasing importance for all countries in the future. This is especially the case in Europe.

Climate change

Global warming threatens to result in more extreme weather events, such as more frequent dry periods (moisture deficits) and storms (catastrophic damages to forests). Even the political bodies in most countries are increasingly concerned about this phenomenon, and this problem is likely to provoke many more reactions in the future.

However, an increase in temperature may – other than in some tropical and subtropical regions – improve the growing conditions, especially for demanding broadleaves, and will be advantageous for forestry in Ireland and some other parts of the temperate zone. This will probably have a long-lasting effect. Therefore, broadleaves will deserve closer attention in the long run.

Role of forests as carbon sinks

The steady rise of CO₂-content in the atmosphere has provoked serious concern and discussion continues about reduction possibilities. Obviously, forests are the only

terrestrial sinks of importance that can be regulated by man to any significant extent. Therefore, it can be expected that all states will face rising pressure to enlarge their forest area, to enhance tree growth and thereby intensify carbon sequestration.

In Germany for instance, where forest cover is at present 32%, the Society of German Foresters recently pre-emptively recommended an increase of this proportion to 40%, partly because of this reason, but also because the need for timber production will increase, and biodiversity will be enhanced.

Increasing needs of timber worldwide

According to data collected by the FAO over a period of 50 years (from 1960), timber use has increased as the human population has expanded, and there is little doubt that this trend will continue, at least for the next few decades (Figure 1). Timber and related products will, therefore, be needed in greater amounts in the future.

Renewable energy has become a big international issue. Wood from forests, but also open grounds, parklands and gardens, is currently one of the main sources of biomass and it is likely to grow in importance in the years ahead.

In some countries, like Germany, timber produced for energy use has increased and accounts for a surprisingly high proportion of the total wood output from forests (Table 1). Fuelwood and charcoal have been gradually replaced, first by hard and brown coal and later by oil and gas. Now this development has been reversed and there is no indication that timber for energy use will lose its newly-gained importance in the foreseeable future.

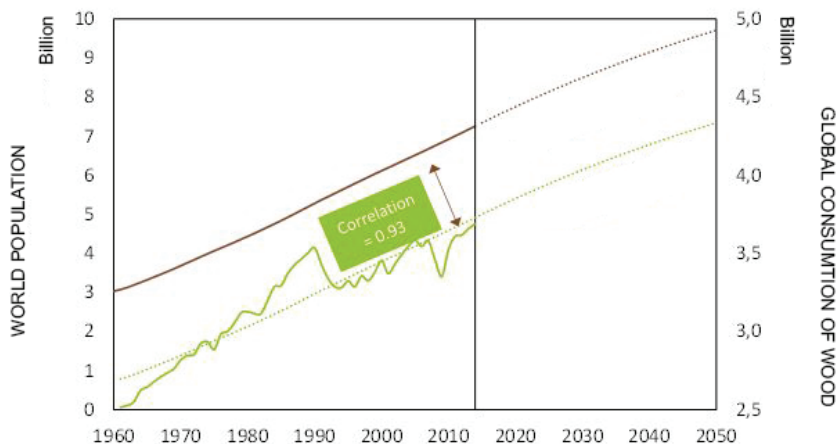


Figure 1: *Correlation between rising world population and timber consumption (FAO 2015). The upper line refers to the rise of world population until 2015 and World Bank forecast up to 2050. The lower (dotted) line denotes global consumption of wood ($\text{m}^3 \text{year}^{-1}$) and its estimated development.*

Table 1: *Use of timber as source of energy generation in Germany.*

Year	Timber for energy use (%)
1800-1850	80 - 90
1925	40
1970	2
2015	40

Similarly, the emerging energy crisis has yielded its first advantages for Ireland's forestry as even small thinning material from young broadleaf stands can be harvested and sold more profitably than young conifers, whereas in the past, this material would not have been of any value and would have only represented a cost to the forest owner. This development has also added to the viability of such new developing broadleaf forests.

The amount of tropical timber available is decreasing and has become more expensive due to tighter regulation but is still needed for particular uses, such as in the making of fine (mostly expensive) furniture. This provides an opportunity for replacement by high quality (broadleaf) timber of local origin and sustainable production and it makes sense to increase the area of broadleaf forestry in Ireland to meet this developing need. It can be regarded as a general rule that markets tend to gradually become more differentiated and, therefore, need a greater range of timber species and qualities. This means that in Ireland, high quality broadleaf timber will gain importance in the longer run, partly to replace tropical hardwoods.

In the Strategic Plan for the Development of the Forestry Sector in Ireland of 1996, it was stated that, "Broadleaves are important because of both their high-value timber and their environmental role."

Urbanisation vs. rural depopulation

Urbanisation has become a worldwide trend as often the living conditions in rural areas are generally less favorable or lack work-related opportunities. In Ireland, however, the main reason may be the intensification and mechanization of agriculture, which releases people from farmland employment. Forests, however, if managed intensively, need higher manpower per area than agriculture, especially in extensive upland pasture systems in western and mountainous areas. The creation of new occupational opportunities in such areas would offer prospects to slow down migration into cities. Additionally, development of forests, recreational and/or nature conservation areas generate further opportunities for recovery and bring new forest education approaches and may even increase job opportunities to service these needs.

Overall, it can be concluded that the main external future prospects for further expansion of forests in Ireland seem promising and may open up new opportunities for implementing more intensive forest management practices.

Options for forest development in Ireland

Forests now cover roughly 9% of the land area of Ireland, in which conifers dominate (Table 2).

In 1996, a goal of 17% (about 1.2 million ha) of the productive planted forest area was suggested with an objective:

To develop forestry to a scale and in a manner which maximizes its contribution to national economic and social wellbeing on a sustainable basis and which is compatible with the protection of the environment.

Such a target was originally stated in the strategic plan for forestry, *Growing for the future – A strategic Plan for the Development of the Forestry Sector in Ireland* (1996) and has more recently been reiterated in *Forests, Products and People – Ireland's Forest Policy, a Renewed Vision* (2014):

To develop an internationally competitive and sustainable forest sector that provides a full range of economic, environmental and social benefits to society and which accords with the Forest Europe definition of sustainable forest management.

Thus, the international aspect, as well as sustainability issues, have now come more into the focus.

It is questionable as to what can and should be done to further develop forestry in Ireland. In *Broadleaf Forestry in Ireland*, the authors tried to envision the possible activities necessary to further develop Irish broadleaf forests. There are two possible options: conversion of existing forests and afforestation (Table 3) which are explained below.

Table 2: *Forest area of Ireland (according to NFI 2013).*

Forest type	Area (ha)	Area (%)
Conifers	440,000	69
Broadleaves	112,000	17
Mixed forests	88,000	14
Stocked area	640,000	100
<i>Proportion of total land</i>		<i>9.1</i>

Table 3: *Potential forest area available for conversion and afforestation with broadleaved species.*

Type of Land	Minimum	Maximum	Units
Conversion of existing forests to broadleaved cover	50,000 10	200,000 25	ha % land cover
Afforestation and conversion of non-forest area (e.g. grassland, scrub, cutover peat etc.)	150,000 3	500,000 10	ha % land cover
Total	200,000	700,000	ha

In detail, these options denote:

- Conversion of existing forests: While large areas of the broadleaf forests consist of mainly birch and willow stands, which are of low production, it is suggested that these areas should be re-evaluated with a view to be converted into units of higher production, mainly by means of under-planting. Moreover, forests of the former estates are often over-mature and degraded and should be regenerated. In total it is estimated that approximately 50,000 ha at a minimum, and possibly up to 200,000 ha, are available which seems to be a realistic, but still conservative, estimate.
- Afforestation: Afforestation of arable land will inevitably be more difficult and likely to provoke conflicts with agriculturists. Therefore, only sites that are not suited for agriculture have been included in our calculations which vary between 3 and 10% of the land area.
- A third possible option is for the State Forestry sector (i.e. Coillte) to be required to establish and manage a percentage of new broadleaf woodland each year, rather than its current almost exclusive coniferous woodlands. Again, this could be achieved by replacing some of the coniferous forests with broadleaves, particularly on good quality sites where broadleaf forests could be established very successfully and would be more likely to result in the production of quality hardwood logs.

Again, the above calculations are deliberately conservative. Nevertheless, it is estimated that between 200,000 and 700,000 ha of new forests could be established, which would lead to an increase of the forest area by a third, or more than double the current area.

In summary, there are large areas available for conversion into productive forests which would meet the above-mentioned challenges: rise of timber supply, fixation of carbon dioxide, creating more jobs in rural areas and providing recreational as well as nature conservation areas.

Currently however, the prospect of the above plans being realised in the next few years are low. Roughly 100,000 ha of forests have been established during 2003-2015, or 7,500 ha per year on average, but the yearly area declined from about 10,000 ha steadily to 6,000 ha per year within this period (Figure 2) and it is believed that the figures for 2017 have even dropped further.

Moreover, the proportion of broadleaf planting had diminished from $\frac{1}{3}$ to $\frac{1}{5}$ by the end of the period (2015). It may be assumed, therefore, that forestry has become less attractive for farmers and other landowners, and even disproportionately so for broadleaves. This may be due to insufficient encouragement through grant aid. Anyhow, there is a great gap between the current planting target of 6,000 ha per year and 15,000 ha which should be brought into production annually, based on the stated

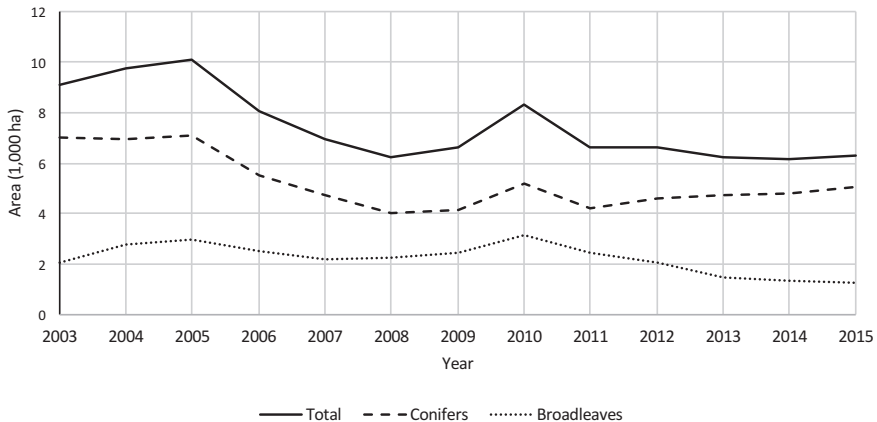


Figure 2: *Afforestation in the Republic of Ireland during the period 2003-2015 (Irish Timber Growers Association 2017).*

objectives in the renewed vision of forestry in Ireland (Department of Agriculture, Food and the Marine 2014). Apart from afforestation and the conversion of degraded forests, the Irish landscape offers great opportunities to improve the status of many hedgerows by enriching the most suitable ones with single broadleaf trees. Assuming appropriate tending and pruning, this would produce valuable timber and add to the beauty and biodiversity value of the countryside. Surprisingly, this issue, though practiced in several countries like the Netherlands, Turkey and Montenegro, is not mentioned in any forest policy statements. According to remote sensing inventories, hedgerows cover an area of c. 4%, thus offering another potential way of increasing national tree cover, especially of a broadleaved nature. Though not strictly forest area, such cover could contribute to many of the services provided by forests, assuming suitable management.

The present situation is somewhat comparable to that after the 2nd World War, when Clear criticised in 1948, “if forestry is to play its appropriate role in the future welfare of the country, we must plan anew the road ahead with **vision** [printed bold by the author] and courage. At present there is evidence of a spirit of lethargy which was foreign to Irish forestry in its earlier pioneer days” – and finally, “without a dream a people perish!”

Requirements for future development of forestry in Ireland

In order to implement and fulfill this ambitious programme, direct and indirect financial assistance, support and advice from the state agencies seem to be an indispensable requirement as follows.

Direct support

Several programmes that have been carried out for long periods will need to be continued in the long term:

- Allocation of grants for afforestation, conversion, tending and thinning of stands need further review and development. Early tending and thinning treatments normally do not cover the costs, but if these operations are delayed the quality of the resulting timber may be adversely affected. Therefore, grants are indispensable.
- Further improvement of the infrastructure network, especially forest roads.
- Training of forest workers (worker schools), as well as advanced education of forestry staff members. It is expected that annual harvesting of timber will double from 3.2 million m³ yr⁻¹ in 2010 to 6.5 million m³ yr⁻¹ by 2028. Therefore, many more work opportunities will result, and an increased and well-trained labour force will become necessary.
- Support and training of private forest owners.
- Their share of the workforce will increase as more forest establishment takes place mainly on the ground and they will need continuous training and support.

Although 6,000-7,000 ha have been afforested annually within the last decade – which is quite an impressive figure – another 100 years will be needed to double the forest area and to achieve the above-mentioned goals at the current rate. Thus, the efforts to expand the Irish forest area and its quality have to be markedly increased, upgraded and more fully developed, with deliberate efforts to improve biodiversity and social functions.

Forestry sector indirect support (e.g. a dedicated forest research organisation)

Irish forestry has now reached a reasonably well-developed position and will further gain increasing importance. To meet the above challenges, as well as to further improve its management standards, it needs a long-term and practice-oriented forest research organisation, similar to that in other countries with comparatively well-developed forestry industries. From experiences in these countries, such long-term and applied functions and requirements cannot be covered by institutions like the Forest Service, which is mainly bound to administrative duties, or by universities, which must concentrate preferably on short-term scientific projects. At one point, Ireland possessed an active forest research branch which was – unfortunately – abandoned in the 1980s. Similar sentiments were expressed by Clear in 1948 when he complained about the “absence of research.” I find myself herewith repeating the mantra. Some specific areas that need attention include:

- monitoring of climate and soil development in the forest environment;
- studies of growth and yield (mixtures, exotic and other potential species, provenance trials);

- development of efficient methods of timber processing and enhanced forest infrastructure;
- monitoring of risks, diseases and damage to the forests and developing adequate counteractive measures;
- development of programmes for integration of forest management and nature conservation;
- development of programmes on environmental education, forestry education, recreation;
- close cooperation with universities and other research institutions;
- stronger links with similar organisations overseas.

Conclusions

The role of forests in the landscape and as places of employment will increase in the future. Forestry will provide retreat areas for fauna and flora, as well as sources of recreation and may become an important contact point with nature for the people. Forestry, therefore, is much more than timber production and this issue will become progressively more relevant as the industry grows and becomes sustainable.

Ireland has a substantial – possibly even great – future as a forestry country in the long run. To maximise this sustainable goal, however, long-term investment and increased cooperation are necessary. In addition, a greater commitment towards continuous development is essential and the potential negative effects of short-term political decisions and fashions on forestry need to be countered. Moreover, as science and research become increasingly sophisticated, developments in forestry also need more sophisticated, long term and multidisciplinary approaches.

Broadleaf forestry may still play a minor role for some time to come as compared with that of conifers, but – I am sure – it will gain increasing importance especially in combination with conifers, as mixed stands gain increasing importance and to improve the physical stability and biodiversity of forests. It is envisaged that the publication of *Broadleaf Forestry in Ireland* will help support this major future development.

Acknowledgement

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