# The International Forestry Scene: Environmental and Wood Supply Issues<sup>1</sup>

R. Cooper and L. Roche

School of Agriculture and Forest Sciences, University College of North Wales.

<sup>1</sup> Paper presented to the Annual Symposium of the Society of Irish Foresters, April 1991.

#### Summary

Deforestation rates in the tropics continue to increase and recent estimates show an annual rate of deforestation of 17 million ha. World concern about the loss of biodiversity and adverse climate change are beginning to have an effect on timber production in a number of major exporting countries. Future supplies of timber to world markets from natural tropical forests are likely to decline. Future increases in industrial wood supplies will be drawn principally from plantations in developed countries. Despite a growth in wood production in Western Europe, imports of forest products will continue to increase offering growing export opportunities for Ireland. A careful review of Irelands's comparative advantages in wood products manufacture and export opportunities must be made in developing strategies for the expansion of the Irish wood products industries.

## **Tropical Forest Resources**

Environmental degradation as a consequence of deforestation in the tropics and sub-tropics is massive. In many nations with low and erratic rainfall over much of their territory, e.g. Ethiopia and the Sudan, the ecological basis of rainfed agricultural production has been undermined and chronic famine conditions prevail. These local and national consequences of deforestation have not had any significant effect on world trade in forest products. They occur, for the most part outside the tropical hardwood regions and do not have "forest dwellers" of the kind that attract the attention of the media as in Amazonia and Malaysia. Thus, though of the profoundest importance, local ecological degradation as a consequence of deforestation is not discussed in this paper.

The issues that have begun to significantly effect world trade in tropical timbers relate primarily to a growing awareness in the developed world of a possible, progressive deterioration in the global environment combined with a permanent loss of mankind's inheritance of biotic diversity. Nearly all attention in this regard is directed to deforestation in Amazonia and to a lesser extent to South East Asia. The fact that the forests of Amazonia are at least 85% intact and the rainforests of such West African countries as Ivory Coast and Nigeria are 85% destroyed does not lessen this concentrated

attention. Thus, this paper is concerned, *inter alia*, with those global environmental issues associated with deforestation which lead to political and policy changes influencing in turn world trade in forest products.

There are various sources of information on tropical deforestation which can be grouped into two principal categories (i) United Nations (UN) and (ii) non-government organizations (NGO'S) and informed individuals. These two sources in the recent past appeared to contradict each other. The data presented by UN sources, through the Food and Agricultural Organization (FAO) have been considered by NGO sources as being unreliable since they were, it was said, too heavily influenced by subjective and self-serving assessments by national governments. On the other hand, criticisms of the data presented by NGO's were directed to the lack of scientific rigour and a standard methodology in collecting data.

Recently, these two sources of information on deforestation in the tropics have begun to complement each other as the FAO data becomes less dependent on national government assessments and the rigour of its methodology and terminology begin to be accepted by most agencies. The present paper draws on both sources.

# **Extent and Rate of Deforestation**

Deforestation has for the most part ceased in the developed world, and many countries of which Ireland is one, are extending their forest estates. In a number of European countries forest decline and associated environmental concerns have shifted emphasis away from wood production to environmental conservation. The following assessment of deforestation is confined, therefore, to the developing countries of the tropics.

Usually the rate of deforestation, expressed as a percentage of total forest cover, is a small quantity. The FAO, together with the United Nations Environment Programme (FAO/UNDP) published a study of deforestation in 1980, giving a tropical deforestation rate of 0.6% or 9.2 million ha. annually. A second source of information, around about the same time, gave a much higher deforestation rate of close to 20 million ha. annually (Myers 1980).

The problem here relates to the fact that only very few countries in the tropics have made reliable and repeated estimates of their forest resources. The number of countries with repeated forest surveys is very small. Only Brazil, India, Indonesia and Myanmar have completed assessments for two separate periods. However, even these countries have not designed their surveys specifically for the assessment of change and, as a result, the error associated with the estimation of deforestation is high.

However, preliminary results are now available for the more scientifically rigorous FAO, 1990 Tropical Forestry Assessment. These results relate to 62 countries largely located in the moist tropical forest zone. Grouped

into three main tropical regions, estimates of forest cover and rates of deforestation are given in Table 1.

**Table 1:** Provisional estimates of forest cover and deforestation for 62 countries in the tropical regions. The countries include almost all of the moist forest zone, along with part of the dry zone (Lanly *et al* 1991)

Tropical Region	Number of Countries Studied	Total Land Area ( ——	Forest Area 1980 - million	Forest Area 1990 ns of ha	Annual Deforest 1981-90 a — )	Rate of Change 1981/90 (% /annum)
Tropical Africa	15	609.8	289.7	241.8	4.8	-1.7
Tropical America	32	1,263.6	825.9	753.0	7.3	-0.9
Tropical Asia	15	891.1	334.5	287.5	4.7	-1.2
Total	62	2,764.5	1,450.1	1,282.3	16.8	-1.2

It is now accepted by the FAO that the 1980 assessment, for a number of reasons, under estimated the rate of deforestation. However, even allowing for under estimation in 1980, it is clear from FAO figures (Table 1), and despite the existence of the Tropical Forestry Action Plan (TFAP) during the second half of decade, that the rate of deforestation has significantly increased during the decade 1980-1990. It is now estimated at 1.2% or nearly 17 million ha annually.

The latest estimates from non-government organizations (Myers 1989) give a rate of deforestation of 1.8% per annum or 14.2 million ha annually of an estimated total forested area in the tropics of 800 million ha in 1989. Myers (1989) assumes a smaller total area of tropical forest cover (800 million ha) than the FAO study which estimates for tropical forest a total coverage of 1,282 million ha in 1990. Brazil, Indonesia and Zaire between them account for 50% of all remaining tropical forests and the rate of deforestation in these three countries is estimated at 6.6 million ha annually or 46% of total tropical deforestation (Myers 1989).

The rates of deforestation given by FAO (1.2%) and Myers, drawing on a diversity of sources (1.8%) are world averages and these obscure very major differences between countries. For the time being the FAO must be considered the most reliable source of information on tropical deforestation (Table 1). There is no doubt, however, that other sources of information on tropical deforestation, such as those referred to here (Myers 1989), must increasingly be taken into consideration. In this regard the values given in Figure 1 for particular countries are likely to be valid in a comparative sense.

#### **Effect on Environment and Tropical Forestry Development**

Houghton (1989) has reviewed the interactions between tropical forests, deforestation, and climate. In so far as deforestation is concerned the principal consequences are changes in evapotranspiration and albedo which in turn result in changes to convection currents, precipitation patterns and rainfall regimes. Houghton (1989) concluded that important as these changes are, for example local ecological degradation referred to in the introduction, much larger changes appear to be introduced at global level through emissions of carbon dioxide, methane and nitrous oxide as greenhouse gases. Of these, the most important is carbon dioxide.

It is estimated that the total carbon release from deforestation in 1989 was between 2.0 and 2.8 billion tonnes, the mean working figure being 2.4 billion tonnes, and that this represented an increase of 41% over the 1979 figure. Carbon dioxide release from combustion of fossil fuels world wide is estimated at 5.6 billion tonnes annually the bulk of which occurs



Figure 1: Estimated Percentage Rate of Annual Deforestation.

in developed countries. It is believed that the contribution of deforestation appears to be expanding more rapidly than that of fossil fuels. Extrapolation of recent trends suggests a peak of 5.0 billion tonnes by early next century (Myers 1989, Houghton 1989).

Continued public support may be expected for non-government agencies concerned with the deterioration of the global environment. In addition, these agencies are becoming much more knowledgeable in regard to the causes of this deterioration. Their scientific and technological competence has increased substantially in recent years. Finally, their expertise in the use of the media often exceeds that of government spokesmen. Representatives of non-government agencies are now invited to discuss at the highest level the restructuring of the TFAO and its future role in tropical forestry development.

These developments, together with the growing concern of governments in the industrialised world for what is perceived to be a serious threat to the global environment, are beginning to influence tropical forestry and trade in a number of ways. These may be summarized as follows:

- (i) Decreased emphasis in the TFAP on production forestry particularly as it relates to logging of tropical hardwoods and the establishment of industrial plantations of such species as Eucalyptus and pine.
- (ii) Investment opportunities by such agencies as the World Bank will be increasingly directed to forms of forestry development that appear to be ecologically benign, sustainable and equitable.
- (iii) The export of tropical hardwood logs will be increasingly prohibited and investment will be sought for the establishment of local wood processing industries.
- (iv) Growing support is likely from the developed world for the establishment of national parks and other protected areas in tropical rainforest regions, and for the establishment of national forest estates (gazetted) for management and the production of goods and services in perpetuity.
- (v) Support is likely to continue and to grow for agroforestry and forestry development by the private sector in the tropics.
- (vi) Nations such as Nigeria, where massive deforestation has occurred will become major importers of wood and wood products.

## **Temperate Forest Resources**

In contrast to the shrinking forest estate in most of the developing world the forest area in several parts of the developed world has increased over the last 30 years. According to FAO (1988b) the forest area of Western Europe expanded by 13 million ha or 11% between the mid 1960s and mid 1980s. In addition to Ireland and the UK, increases of over 10% also occurred in



Hardwoods 156 million cu.m.



Source : Woodbridge Reed and Associates.

Figure 2: Growth in Wood Supplies 1985-2000.

Finland, France, Portugal and Spain. FAO data also indicate a substantial increase in the forest areas of the USSR and China.

Over the next 30 years there is likely to be a continuing expansion of the commercial forest estate in most countries of the developed world. Nilson *et al* (1989) estimate an annual growth of over 300,000 ha in Europe (West and East) between 1985 and 2020. In the EC the overall increase in the forest area over the same period is put at 8.3 million ha, a growth of 22%.

# Wood Supplies

Several agencies have presented scenarios of future world wood supplies. Examples are the series of FAO Forest Products World Outlook Projections dating from 1980; European Timber Trends and Prospects (FAO/ECE 1986) and the models developed by IIASA (Kallio *et al* 1987). Figure 2 shows projections of future world supplies made in a recent study commissioned by the Canadian Government (Woodbridge Reed & Associates 1988). The chart depicts the forecast increases in wood supplies by region over the period 1985-2000.

Softwoods are forecast to contribute 60% of the supply growth and hardwoods 40%. The biggest increases in softwood supplies are predicted for the USSR but given the political and economic upheavals in the Soviet Union considerable doubts must exist about this projection. The USA and Canada are likely to continue to be the major sources of export growth but substantial increases are also expected from Chile, Brazil and New Zealand. Growth in Nordic Europe and the EC are forecast to be roughly similar in magnitude.

With hardwoods Brazil, USA, Canada and S.E. Asia are expected to be the major areas of export growth.

A notable feature of these future supply increases is that 70% of the softwood and 80% of the hardwood increases are forecast to come from plantations.

In the context of these world wood supply projections the forecasts made for increases in Ireland, Britain and Western Europe are small at 0.5%, 0.7% and 3% respectively of the estimated world growth.

Ireland's strategy for its wood based industries must take account of world and regional developments in wood supplies and forest products requirements because these will clearly influence conditions in Ireland's export markets.

### **European Import Requirements**

The EC countries and particularly the UK are likely to be the focal point of Ireland's export growth. Table 2 summarises the EC and UK imports of major forest products in 1989.

Product	Units		EC	UK
Sawn softwoods	millio	n <sup>m3</sup>	24	8.5
Sawn hardwoods	"	"	6	1.0
Particle board	"	"	5	1.6
Plywood	"	"	3.5	1.4
Fiberboard	"	"	1.3	0.3
Wood pulp	millio	n tonnes	10.5	2.1
Newsprint		"	5.0	1.6
Other paper & board		"	19.0	4.4
Source ECE/FAO 1990				

Table 2. Imports of Forest Products in the EC and UK 1989.

The EC is the world's largest importing region for forest products with imports totalling £23 billion in 1988. Within the EC the UK is the largest importer with an import bill of £5.9 billion in 1988, roughly one quarter of total EC imports.

Future import requirements are extremely difficult to predict particularly on a product by product basis because they depend on assumptions made about future consumption, production and exports of forest products.

Projections made by FAO (1988) and Woodbridge Reed & Associates (1988) for Western Europe (excluding Nordic Europe) are shown below. The figures refer to the expected increases in net imports between 1985-2000.

			FAO	WRA
Sawn softwoods	(million m <sup>3</sup> )	)		+7
		)	+1.6	
Sawn hardwoods	(million m <sup>3</sup> )	)		+7
Panel products	(million m <sup>3</sup> )		+2.5	+3.2
Wood pulp	(million m <sup>3</sup> )		+2.3	+3.2
Paper	(million m <sup>3</sup> )		+2.8	+1.2

Despite the differences between these forecasts it seems clear that Western Europe has a growing import requirement which offers opportunities for the forest products industries of Ireland.

# **Export Strategies for Ireland**

To maximise the benefits offered by expanding market opportunities in Europe the selection of products and markets must be made carefully. This requires a detailed examination of the market opportunities, possible industrial developments and the incentives necessary to attract investment. This final section outlines factors relevant to these decisions and also suggests possible strategies for Ireland.

First it is necessary to consider the comparative disadvantages and advantages of Ireland as a forest products manufacturing country. These must be seen in a global context as most major world producers are likely to target the European market for some of their exports.

The advantages of other producing regions vis-à-vis Ireland can be summarised as follows:

- \* Large wood resources giving rise to scale economies in manufacturing. Canada, USA, Sweden, Finland, Chile and Brazil offer these advantages which are of key significance in the manufacture of pulp, paper and wood based panels.
- \* Existing market presence in the EC and integration with European consuming industries. Again these benefits are mainly associated with North American and Scandinavian producers and are of particular importance in pulp and paper, the most vertically integrated of the forest industries. Increasing integration in the timber sector is occurring and seems likely to intensify.
- \* Low wood costs. Brazil, Chile, Spain, Portugal and the USA all have, and are likely to continue to have, lower wood costs than Ireland. This is of importance to all the manufacturing industries but particularly sawmilling where raw material costs may make up 70-80% of total manufacturing costs.
- \* Low energy costs. North America, New Zealand, Chile and Brazil have important energy cost advantages, these being particularly significant for mechanical pulp and paper manufacture.
- \* Technical "know-how". The major forest products manufacturing countries i.e. USA, Canada, Sweden, Finland, Germany generally have the most highly developed technologies. These ensure the most efficient production techniques combined with excellent quality control of end products.

These factors will generally give other producing countries a competitive advantage over Ireland. However, offsetting these are certain advantages for Irish based manufacturers. These are now summarised:

\* Tariffs

In the EC wood panels and paper products (the higher added value products) are protected by tariffs against supplies from countries outside western Europe.

 Freight costs and delivery times.
Ireland has freight cost advantages to much of the European market over North and South America and Scandinavia. \* Excellent raw materials. Spruce is an ideal raw material for pulp and paper and board products.

\* European exchange rate mechanism. Ireland's exchange rates are likely to be more stable with respect to EC currencies than countries outside the ERM.

\* Investment costs.

Investment costs in Ireland will generally be lower than in developing countries because of a well established infrastructure.

In addition to the above factors a second general point about forest products markets requires mention. A high proportion of world trade in forest products occurs in commodity products e.g. carcasing softwoods, standard grades of particleboard and MDF, kraft pulp and newsprint. World trade in these products is highly cyclical as are prices and profitability. Competition is focused on price and profit margins are small. Supplies of these products to the European market are dominated by a small number of large exporting countries e.g. Canada, USA, Sweden, Finland, Germany who often benefit from the advantages listed above.

Based on these general observations tentative guidelines for Ireland's export market strategies can now be suggested.

In the sawmilling industry the nature of the raw material probably confines the sawn product to fiercely competitive market segments such as pallets, fencing and structural timbers. Two broad strategies are suggested. First, Ireland should seek specialist niches in these markets such as supplying special sizes and lengths of timber and ensuring fast deliveries. Second, where possible, the industries should seek to add value to the raw material by preservation, kiln drying, mechanical stress grading, fabrication of end products and components. If these policies can be successfully implemented the industry will distance itself from the most fiercely price competitive parts of the market.

To be able to offer these products and services, sawmills will need to be extremely flexible in their production and product range. This will require modern equipment including facilities for electronic scanning of logs, debarking, mechanical stress grading, kiln drying, preservation and chipping of residues for the board or pulp industries., To be cost competitive such mills are likely to require a minimum log intake of 50,000 m<sup>3</sup> p.a. Investment costs are likely to be of the order of £IR 5 million or more.

In the panel and pulp industries investment costs and wood requirements are generally very much greater than in sawmilling. Specialist manufacturing expertise is also required. Most recent developments in these industries in Britain have involved investment by Scandinavian, North American and

10

German companies. This strategy has certain advantages. It is likely to mean the investment is in proven technologies and that the investor is familiar with the product's markets. The MDF plant in Clonmel and the recently announced CTMP mill in Londonderry are examples of this sort of development. These investments and those in Great Britian have been attracted by financial incentives and in some instances long term wood supply contracts.

An alternative, higher risk and possibly higher reward strategy for small roundwood and residue using industries would be to encourage investment in speciality wood composite products. Research and development in new wood composites is accelerating in North America and Europe as the markets for OSB., Waferboard and MDF become more competitive. These new composites are likely to be suited to smaller plants and hence will require smaller quantities of wood than the established industries. The products themselves are likely to be higher added value products and markets are likely to be less dominated by price. Ireland could well be an attractive European production base for these types of products for manufacturers in Nordic Europe and North America seeking additional wood supplies within the EC.

## **General Conclusion**

From this broad survey of the world's forest resources, and present trends and prospects in the timber and wood products industry in the world generally but in Europe in particular, it is concluded that Ireland is likely to have a comparative advantage in the sector. This, however, will depend on the extent to which the nation can establish and maintain a highly modern and competitive wood processing industry and on the extent to which it will develop its marketing capabilities.

#### REFERENCES

ECE/FAO 1990. Timber Bulletin for Europe. Vol. XLIII No. 8. UN/EEC Geneva.

FAO/ECE 19816. European Timber Trends and Prospects. UN/EEC/FAO New York.

FAO 1988. Forest products: World Outlook Projections. FAO Forestry Paper 84. FAO Rome.

- 1988(b). Production Yearbook. FAO Rome.

- HOUGHTON, R. A. 1989. Emissions of Greenhouse gasses. In N. Myers 1989. Friends of the Earth Report, London, pp 53-62.
- KALLIO, M. DYKSTRA, D. P. and BINKLEY, C. S. (ed) 1987. The Global Forest Sector: An Analytical Perspective. John Wiley.
- LANLY et al 1991. Assessing changes in tropical forest cover. Unpublished manuscript, FAO, Rome. 8pp.

MYERS, N. 1980. Conversion of tropical moist forests. Report to the National Academy of Sciences. National Research Council, Washington DC USA.

- 1989. Deforestation rates in tropical forests and their climatic implications. Friends of the Earth Report, London. 166pp.
- NILSSON, SALLNAS, O and DUINKER, P. 1989. Potential futures for the Forest Resources of Western and Eastern Europe. Paper presented to Conference of Irish Society of Foresters, April 1989. WOODBRIDGE REED & ASSOCIATES 1988. Canada's Forest Industry. Woodbridge
- Reed & Associates, Vancouver.