

ECONOMIC ISSUES IN IRISH FORESTRY

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1. INTRODUCTION

The main objective of this paper is to show the extent to which forestry can provide income and employment in the State. To put the subject in context the paper commences by showing the areas under forest in Ireland and other EC countries. There follows a brief history of forestry in Ireland from the beginning of the 17th century to the present time. We next examine recent developments in forestry including the introduction of the current forestry operational programme and the problems of achieving the planting targets.

The next section deals with the impact of forestry on rural areas with particular emphasis on land use and rural employment. This is followed by a section dealing with the economics of private planting. The paper concludes with a discussion on supply and demand trends for timber, and Irish trade in wood and wood products.

2. THE FORESTRY CONTEXT IN IRELAND

Ireland is the least forested country in the EC. The figures in Table 1 show that in 1990 woodland accounted for only 6.0 per cent of the Irish land area compared with 45 per cent in Greece, 35 per cent in Luxembourg, 32 per cent in Portugal, 30 per cent in Germany, 27 per cent in France and 25 per cent in Spain. The Netherlands and UK had about 9 per cent each while the EC average was 24.3 per cent. The Irish percentage is currently somewhat higher than 6.0 per cent. The estimated total area under forestry at the end of 1992 was 450,000 hectares (ha) out of a total land area of 6.889 million ha which is 6.5 per cent.

Ireland has the highest proportion of coniferous trees in the EC, 90 per cent compared with

Table 1: Forestry in EC Countries in 1990

	B	DK	GER	GR	SP	F	IR	IT	LUX	NL	P	UK	EC 12
Woodland Area('000 ha)	617	493	7360	5755	12,511	14,688	415	6410	87	330	2986	2297	53,949
Conifers (%)	47.0	63.0	69.0	18.6	48.0	30.0	90.0	25.2	34.0	64.5	46.4	73.0	41.5
Broad Leaved (%)	53.0	37.0	31.0	81.4	52.0	70.0	10.0	74.8	66.0	35.5	53.6	27.0	58.5
Woodland % of Total Land	20.4	11.6	30.3	44.7	25.1	27.3	6.0	21.9	34.5	8.7	32.4	9.5	24.3
Wooded Areas (ha) per person	0.06	0.10	0.12	0.58	0.33	0.27	0.12	0.11	0.22	0.02	0.30	0.04	0.17
Publicly owned forests (%)	46.9	34.5	56.2	85.3	35.0	28.1	79.8	39.8	46.3	46.9	17.0	43.5	42.3
Private forests %	53.2	65.5	43.8	14.8	65.0	71.9	20.2	60.3	53.7	53.2	83.0	56.5	57.6

Irish Figures obtained from the Forest Service.

Source: *Agricultural Situation in the Community* CEC 1992.

an EC average of 41.5 per cent. Other countries with relatively high proportions of coniferous trees are UK, 73 per cent, Germany, 69 per cent, The Netherlands, 64.5 per cent and Denmark, 63 per cent. Countries with high proportions of broad leaved trees are Greece, 81.4 per cent, Italy, 74.8 per cent, France, 70 per cent and Luxembourg, 66 per cent.

Average woodland area per person in the EC (12) is 0.17 ha. The Irish figure is 0.12 ha. Countries with very low woodland area per person are those with dense population such as The Netherlands (0.02), UK (0.04) and Belgium (0.06). Countries with relatively high levels are Greece (0.58), Spain (0.33) and Portugal (0.30).

In nine of the twelve countries the areas under private forestry exceed those under public control. Only in Germany, Greece and Ireland are the areas under public control greater than those owned by private people. Greece and Ireland have particularly low levels of private forestry, 14.8 per cent and 20.2 per cent respectively. However, the area under private forestry in Ireland is increasing rapidly in recent years as a result of increased planting grants and compensatory payments.

3. HISTORY OF FORESTRY IN IRELAND

Up to the beginning of the 17th century Ireland was a densely forested country but over the next 200 years the forests were continually ravished. According to Kula (1992) there were many reasons for this destruction. First, trees located on fertile soils had to be cleared to make room for agricultural expansion to support a growing population. Second, clearance took place to provide fuel for the iron smelting industry in the 17th and 18th centuries. Third, the rise of Britain as a major industrial and naval power took its toll on forests. Timber had always been used as pit props in the coal mining industry and an expansion in this sector meant a decline in forests. Also at this time timber was widely used in the ship building industry. The world's most powerful nations (including Britain) had an insatiable appetite for wood and it was not until the building of the first iron ship by the Royal Navy in 1860 that the appetite declined. Irish forests contributed greatly to British demand. The huge appetite for wood in England encouraged the English settlers in Ireland to export large quantities of timber from which they reaped rich profits.

The fourth reason for the destruction of Irish forests was related to military purposes. During the colonial struggle many forests were cleared because they provided cover for the local resistance groups. This clearance was particularly extensive in Ulster.

Towards the end of the 18th century a revival took place in forestry in many parts of the British Isles, including Ireland. The aristocracy came to realise that woodland was a

desirable source of wealth and amenity and this led to intensive plantation for commercial as well as for ornamental reasons. Forests in private estates were maintained for generation after generation for reasons of sentiment and prestige.

The Irish Land Acts which conferred rights of ownership on tenant farmers had a serious effect on this tradition. Landlords whose estates were about to be divided decided to cash in on their timber supplies while tenants receiving forested land cut down the trees to make room for agriculture. According to Neeson (1991) the havoc wreaked on woodlands as a result of the Land Acts, first by landlords and later by the new owners eager to raise ready money, was a great setback to such progress in forestry as had been made in the 19th century. It was not until the Forestry Act of 1928 that compulsory re-planting was introduced. Though the Wyndham Land Act of 1903 is greatly blamed for the decline in forestry progress, that year was an important one for forestry in Ireland. A forestry branch of the Department of Agriculture and Technical Instruction was established and the Department bought land in various areas in order to establish forestry centres. Avondale in Co. Wicklow was one of these where a training school was established in 1904. Some progress was beginning to develop at public if not at private level.

Unfortunately, the First World War put a stop to the expansion of forestry projects. During the war Britain suffered a severe shortage of timber. The German submarine campaign reduced imports to almost nothing and domestic stocks were almost exhausted by the end of the war. At this time timber was a strategic commodity used intensively for pit props - the country's vital source of energy being coal. After the war the Prime Minister, Lloyd George, admitted that Britain was nearer to losing the war from lack of timber than from lack of food. Some government planting was done in Britain after the war but as a result of an expenditure cut during the 1922-24 period the afforestation programme was curtailed.

A similar situation occurred in Britain during the Second World War but the availability of mechanical equipment at that time enabled the haulage of softwood from the north of England and Scotland.

Having had two bitter experiences of timber shortages, plantations were created in many parts of Britain after the war and forests in general have enjoyed a long period of growth under the political policies of successive governments. Today the Forestry Commission (established in 1919) is the biggest landowner in Britain: it manages over 1.5 million hectares of land and gives aid to private forests dealing with a further 1.5 million hectares of private plantations (Kula 1992, p. 64).

Forestry under Native Irish Government

When the Irish Free State came into existence on 6 December 1922 there were only about 220,000 acres of forestry in the new State, practically all of which belonged to private people. The State also inherited a forest service with plans and requirements of its own. Up to that time forestry operations were financed by the British Forestry Commission. Now the burden of financing forestry fell on the Irish Government.

During the War of Independence various nationalist writers and politicians had argued for an increase in the forestry area but in 1922 the new government had to come to grips with the reality towards which their political ideals had impelled them. As Neeson (op. cit., p. 153) says:

... like successful revolutionary politicians the world over they were suddenly face to face with these issues which compel the most high minded to expediency. In simple truth the bottom line, that every politician in a representative democracy must face, is that no matter how high minded your principles, if the voters don't like them you're out. One does not have to be a political expert to appreciate that long term programmes (like forestry), the first returns of which will not materialise for a decade at least (and then only on a basis incapable of servicing the capital) are unlikely to be popular with politicians when the statutory term of office is four years.

Therein lay a major dilemma, and by and large that was the case against forestry; it was long term: it was expensive; there was little money to fund it adequately and the farming community was opposed to it. Consequently there were few votes in it, particularly at a time when 50 per cent of the working population was employed in agriculture.

With little or no interest by the private sector, state forestry was to become virtually the only significant form of forestry in the new state but even this made slow progress in the early years. Other than funding, one main theme dominated the question of forest policy. It was announced by the Minister for Agriculture (Mr. P. Hogan) in his annual report for 1925-26.

The Department do not desire to acquire for afforestation land fit for agricultural purposes which might be capable of being used to form new holdings or enlarge existing ones. With a view therefore to preventing such land being acquired for afforestation they have fixed a maximum price at such a figure as to render its sale to the Department for the purpose an uneconomic transaction.

In the 1920s and 1930s the maximum price which the forestry service were allowed to pay for land was £4 per acre and even in those days, land available at this price was of very inferior quality. Hence much of the land planted then and in later years gave very poor tree growth. In a paper read to this Society on 20 December, 1963, H.J. Gray (later to become Assistant Secretary for Forestry in the Department of Lands) said:

Within the general policy framework, the forest authorities over the decades have never been in a position to be fastidious in the acceptance of land suitability because of the constant difficulty of maintaining and enlarging the intake of land to meet progressively increased planting targets. (Gray 1963/64, p. 22.)

Post-War Policy

When the Second World War broke out reserves of good quality timber in Ireland were tiny. State plantations were still under 20 years old and most private woodlands were neglected and unproductive. The country managed to survive but the situation which developed led to an increased awareness in the community at large of the need for afforestation. The war reduced private forestry in the country from some 210,000 acres in 1939 to around 95,000 acres in 1950. Of the latter only about 40,000 acres were fully and satisfactorily stocked. (Neeson, *op cit.*, p. 180).

In the aftermath of the emergency, restoring the nation to a level of peace time progress and prosperity was the first priority. In these circumstances there was an understandable reluctance to invest capital in a long-term project like forestry, still unpopular in rural areas. Consequently, the approach to forestry tended to be gradualist and was aptly summarised by Frank Aiken, Minister for Finance, who in Dáil Éireann on 14 May, 1947 said:

Forestry is not an economic panacea to our present difficulties. Putting young trees in the ground will not put more food on the table. (Quotation from Neeson, *op. cit.*, p. 187)

In the early post-war Ireland, forestry or its implications for the future of the country was receiving little attention. However, a change in government in 1948 brought with it a profound and controversial change in policy. This change resulted from the enthusiasm of one individual Sean McBride, Minister for External Affairs in the new inter-party government. McBride had made agreement on forestry policy a condition of his participation in government and his commitment was such that according to Viney (1966) it was almost fanatical. He demanded three times the annual level of planting, 25,000 acres per annum.

Although McBride was the prime mover of the new approach as Minister for External Affairs he was not directly responsible for its implementation. This fell on the shoulders of Joseph Blowick, Minister for Lands and Forestry who found that the Department of Lands and the Forestry Service had interests which were mutually exclusive. Hence Blowick was subject to contradictory advice and pressures. Matters were additionally complicated by the fact that McBride's policy was strongly opposed on traditional financial grounds by the Department of Finance.

At the end of a long and acrimonious battle McBride's idea prevailed and even though funds were still curtailed, for the first time since the foundation of the State, government and bureaucracy alike began to devote more attention to the question of a defined and sustained forestry policy. They were encouraged in this regard by the US State Department which at the time was providing European Recovery Programme Funds to Ireland. Between 1950 and 1958 acquisition of forestry land by the State amounted to 159,000 acres compared with 210,000 acres between 1922 and 1950. However, the 25,000 acre planting target was not met until 1959/60 when acquisition also reached an all-time high of 28,217 acres. Much of this acquisition and planting took place on the western blanket bogs and is described by Convery (1979) as the western expansion.

The difficulty of obtaining sufficient land was the problem in these (and indeed earlier) years. At the prices which the forest service was still allowed to pay, only the very worst land could be purchased.

Lands which could never be economic were planted willy nilly injecting a counter productive and unprofitable ingredient of social forestry at a time when the guiding principle was supposed to be economic viability (Neeson, op. cit., p. 209).

As a result of this policy some of the present areas under forests are giving very poor yields of low quality timber.

During the 1960s the economy was in a buoyant condition and forestry shared in the general growth. It seemed to be moving towards becoming an efficient national resource. Optimism at this time was given an additional fillip when thinnings from state forests started to become available and pulpwood industries were established in a number of centres throughout the State. These industries prospered in the 1960s but hopes of continued viability were dashed as a result of the recession in the early 1970s.

The period of galloping inflation which began in 1973-74 was disastrous for the forestry industry not alone in Ireland but throughout Europe. It caused a slump in timber prices,

increased labour costs and (as a result of Ireland joining the EC) was accompanied by wildly escalating land prices. The effects of these factors on top of the general recession were instrumental in depressing the activities of the downstream chip and particle board industries that had been set up on the assumption of adequate and economic supplies of pulpwood from state forests (Neeson op. cit., p. 226).

Despite these setbacks the long-term prospects were considered by analysts to be optimistic. Demand for timber within the European community cannot be met from its own resources. Ireland has the largest and most rapidly expanding per capita forest area in Europe. It also has one of the most favourable climates for forest growth, almost double the EC average.

Convery's report (op. cit.) published in 1979 emphasised that forestry, though in a period of temporary difficulty, was an attractive proposition and worth the attention of commercial investors. This along with a departmental report, "The Case for Forestry" (revised 1983) emphasised that the requirement now was for professional marketing both at home and abroad. There was a need for change in dynamic from centralised state control to a more flexible marketing organisation. How to achieve this objective, and what was to follow afterwards became increasingly compelling questions.

The Foundation of Coillte

Following a specific government statement of policy in 1984 that the nation's forests should be developed to the maximum extent, a significant examination of the Forest and Wildlife Service was undertaken. A review group to establish the best way of doing this was set up under the chairmanship of Paddy O'Keeffe, Editor of the Irish Farmers Journal. The Report of the Group published in November 1985 made a number of important statements as follows (Report of the Review Group on Forestry 1985):

- (1) The Forest and Wildlife Service (FWS) has no clear mandate to operate commercially.
- (2) The FWS as part of a government department has a management strategy that hinders it from being run as a profit conscious business.
- (3) There is no clear distinction between commercial and non-commercial activities and
- (4) There are external constraints such as political pressure which have affected FWS profitability and performance.

Having reached this conclusion the group then advised that a commercial body, to be called the National Forest Enterprise, should be set up within the Civil Service to deal with

the problems. In deciding on keeping the body within the Civil Service they were mindful of the fact that the forestry enterprise would not be in a position for many years to finance from its own resources its investment in new forests.

A change of government in 1987 was quickly followed by the establishment of a new State Forestry Board (Coillte Teo.) not within the Civil Service but as an Executive Office more or less independent of it. The government realised that the sale of timber on a commercial undertaking could not be done within the Civil Service and it then decided that an Executive Office was the best arrangement. And so the present Coillte Teo has come into operation. This organisation has taken over all the state forests in the country and is currently involved in the sale of timber and in afforestation and reafforestation on a commercial basis.

4. RECENT DEVELOPMENTS IN FORESTRY POLICY

The absence of private planting over the years was a serious drawback in the Irish forestry programme. Apart from a dislike for forestry by many farmers, no practical solution was offered to the problem of how the farmer might survive the first fifteen years or so of non-productive and labour intensive new forestry. And so despite all the talk and all the developments in state forestry less than 200 hectares per annum of private afforestation was being undertaken in Ireland up to 1979. The financial institutions had expressed no interest in forestry as a vehicle for investment up to this time. It is now believed that the current interest by such institutions was stimulated by two reports, the one by An Foras Talúntais (AFT) in its Resource Survey of Co. Leitrim which appeared in 1978 (An Foras Talúntais, Part IIIA, 1978) and the other by Professor Frank Convery's NESC paper on Irish Forestry Policy which appeared in 1979 (Convery, 1979 op. cit.)

The Foras Talúntais report advised that the only way farmers could be persuaded to plant their land was by providing them with an annual income. It was stated, that while planting grants are an essential help, farmers could not wait 15-20 years for the first income from their trees to arrive. The problem was examined further by the AFT in subsequent years and a number of proposals were made to the EC Commission on how to promote farm forestry (Bulfin, 1992). The major recommendations were that there be:

- (1) improved planting grants
- (2) an active advisory service
- (3) a series of demonstration farms, and
- (4) development of co-operative structures whereby farmers could combine to plant adjoining land.

However, the most vital and strongly supported recommendation was that some form of annual income be paid to the farmer while the trees were growing.

With increasing problems of agricultural surpluses and declining prices, the EC has moved to help farmers diversify out of crops in surplus and into forestry using the above-cited measures. The first such EC scheme used in Ireland was the Western Package introduced in 1981 under which grants for planting were increased substantially. As a result of this scheme private afforestation rose from 275 ha in 1981 to 3,215 ha per annum in 1987 when cattle headage payments were extended to forest areas to compensate for loss of income from farming on afforested land.

The introduction of the Forestry Operational Programme 1989-1993, (1991) under which planting grants were further increased and forest premia made available, gave an additional stimulus to private forestry and by 1991 private first time planting reached 11,289 ha per annum (see Table 2). Up to 75 per cent of these plantings were carried out by farmers on their own land. In that year £10.8 million were paid in the form of grants, headage payments and forest premia to private planters. All private planters receive the planting grant which is 80 per cent of the total planting cost for farmers and can be 100 per cent where some of the work is done by the farmer himself. The grants are somewhat less for other private planters and for Coillte. Only farmers receive the headage payments and forest premia.

The headage payments for those who receive them currently amount to £74.13 per ha per annum for 15 years. The premia vary in relation to the off-farm income earned by the farmer or his/her spouse and as to whether the land was previously unenclosed for agriculture (commonage).

Where the off-farm income does not exceed £14,300 per annum in the previous year and where the farmer owns and resides on the planted land or lives within a radius of 70 miles of it, the premium in 1993 for enclosed land is £116 per ha for 15 years in the case of conifers and 20 years in the case of broadleaved trees. Where annual off-farm income is above this threshold a premium of £50 per hectare is payable.

For land unenclosed for agriculture the premium is £50 per hectare for 15 years for conifers and for 20 years for broadleaved trees.

Table 2: Afforestation, Land Prices, Grants and Compensatory Payments, 1978-1991

Year	Afforestation			Land Prices	Grants ^(a)	Compensatory Payments ^(b)
	Public	Private	Total			
	Ha.	Ha.	Ha.	£/Ha.	£'000	£'000
1978	8,074	179	8,253	108	20.2	-
1979	7,588	134	7,722	153	18.6	-
1980	5,922	268	6,190	252	43.5	-
1981	6,099	275	6,374	462	62.2	-
1982	6,016	498	6,514	408	139.7	-
1983	5,698	311	6,009	515	138.0	-
1984	5,192	473	5,665	600	237.7	-
1985	4,625	764	5,389	707	504.5	-
1986	4,689	2,561	7,250	687	1,788.6	-
1987	5,395	3,215	8,610	796	2,395.2	10.0
1988	7,112	5,252	12,364	994	3,978.2	54.0
1989	6,629	8,594	15,223	1,022	6,491.8	180.2
1990	6,670	9,217	15,887	1,130	7,187.3	429.0
1991	7,855	11,298	19,153	1,203	9,846.9	996.0

Notes: (a) Grants for each year relate to areas planted in that year. The grants included in this table relate to Private Plantings only. Grants paid to Coillte are not included

(b) Compensatory payments. These are premia plus headage payments.

Source: O'Connor, R. and F. Conlon forthcoming.

Achieving the Planting Targets

The planting target in the Forestry Operational Programme is 30,000 hectares per annum. This includes afforestation (first time planting) and reafforestation. If we omit reafforestation, which is about 4,000 hectares per annum, the total new planting projected is about 26,000 hectares per annum. If this target was achieved it would take about 9 years to have 10 per cent of the land area of the state planted (to get from the current area of 450,000 to 689,000 hectares) and a further 12 years or so to reach the 1 million hectare mark. This target is ultimately achievable but it will probably take much longer than the above length of time.

Reference to Table 2 shows that afforestation increased rapidly between 1987 and 1991 reaching 19,000 hectares in the latter year. Unfortunately the impetus was not maintained in 1992, and the area planted declined to about 16,500 hectares in that year. Some of this decline was no doubt due to the depression which is causing low timber prices at the present time. But even with improved timber prices it may be difficult to maintain the recent level of farm planting.

As indicated earlier there is a considerable hostility towards forestry among the farming community. The improved grants and premia at a time when agricultural incomes were depressed succeeded in stimulating farm planting. However, with the extensification premia now available, and improved headage payments for cattle it will be more difficult to maintain the momentum reached in 1989-91. A vigorous campaign by the Teagasc advisors pointing out the advantages of forestry and further adjustment to the aids for afforestation would seem to be the best way forward.

Unfortunately, because of their background and training many agricultural advisors are not very enthusiastic about forestry. Their support therefore needs to be won over by stepping up the current government campaign and pointing out the economic advantages of a planting programme on marginal land. In a later section we discuss briefly the economics of forestry for farmers, and in more detail the economics of non-farm planting, where the planter has to purchase the land and pay the going rate of wages for all work done.

5. THE IMPACT OF FORESTRY IN RURAL AREAS

As shown above the Forestry Operational Programme has succeeded in increasing the area of land planted to trees by the private sector, but the question to be answered is can forestry development replace a crumbling small farm structure in many parts of Ireland? To what extent can a forestry programme provide a viable social structure based on village and community living, particularly in areas where land is marginal for agriculture but which can give good forestry yields?

The impact of forestry on rural areas must be looked at from two perspectives. On the one hand we must look at it as a user of land and a creator of income. On the other hand we must examine its employment creation potential. We look first at the land use aspect.

Availability of Land for Forestry

Under the recent CAP reform proposals farmers on whose land the stocking rates are less than 1.4 livestock units per hectare are entitled to extensification premia based on the

number of cows, male cattle over 6 months of age and ewes on their farms (heifers of all ages, male cattle under 6 months of age and horses are excluded in calculating the stocking rates). This policy creates an incentive to keep stocking rates under the 1.4 hectare level and is a disincentive to forestry. The planting of some land on a farm to forestry and the concentration of the stock on a smaller area could push the stocking rate over the 1.4 limit and render the farmer ineligible for the premium which is £26.36 each for suckler cows and eligible male cattle.

Having carried out a detailed examination of this issue we discovered that according to the concept of stocking rate used for implementing the extensification measure (Teagasc National Farm Survey Files) 71 per cent of the grassland area of the state is stocked at less than 1.4 livestock units per hectare and 43 per cent has a rate of less than one unit per hectare. The amount of land in the latter category in 1991 was 1.7 million hectares.

It has been demonstrated in numerous Teagasc reports that farm incomes are highly correlated in a positive direction with stocking rates. Hence these figures indicate that a very high proportion of farm land is yielding very low incomes. Also, with increasing areas of marginal land being left derelict, a substantial area is producing no agricultural income at all.

Because the stocking rates are so low we have estimated that it is possible to concentrate stock numbers on smaller areas of a large number of farms without exceeding the extensification limit, thus releasing considerable areas of land for forestry and thereby enhancing the returns from such farms. It is estimated that up to 1 million hectares could be afforested without reducing the available extensification premia or other farm income. The problem of course is to get this land planted.

Forestry and Rural Employment

Rural areas are constantly losing jobs because of the inexorable decline in the agricultural labour force. The numbers at work in farming fell at an annual average rate of 3.1 per cent in the 1960s, 3 per cent in the 1970s and 2.7 per cent in the 1980s. Thus the rate of decline has been tapering off in recent years. But despite this the exodus is bound to continue. The more "rural" the area the greater the migration and the population decline.

It is in this context that forestry must be placed in a longer-term perspective. Together with other developments, like farm diversification, agri-tourism, and small community enterprises, forestry is now being actively promoted to, *inter alia*, provide rural employment. The extent to which forestry can create employment must however be placed in its proper

context. As Table 3 shows employment falls to very low levels from the 6th to the 12th year after planting. It starts to build up again in preparation for thinning in the 15th year and takes off at a relatively high level after that as thinnings become available and regular amounts of timber are harvested. There is therefore a long wait after planting before any worthwhile employment is generated.

This method of presenting the labour requirements, while quite correct, tends to give a misleading impression of the situation. In practice some planting goes on every year and the labour requirements are not as bunched as shown here. Given a mature forest situation, where a similar area is clear felled and replanted every year the annual labour requirements become fairly constant and the average figures given in Table 3 apply. These requirements are one man year per 35 hectares of forest for planting and other operations to the clear felling extraction and haulage stage, one man year per 68 hectares for processing and one man year per 23 hectares for all operations combined. Forestry is, therefore, not a very labour intensive enterprise. However, because it takes place on land which is producing very little if any, agricultural output, it does not depress other activities and is thus additive in terms of labour use.

Table 3: Employment per 1,000 hectares Sitka Spruce Forest (Yield Class 20^(a))

Number of years	In Forest including		Total
	haulage	Processing	
Man years per annum			
1-5	7	-	7
6-12	1	-	1
13-14	4	-	4
15-35	24	12	36
36-40	123	71	194
Average man years/1,000 ha	29	15	44
Hectares/man year	35	68	23

Note: (a) Yield class is defined as the average yield of timber in m³ per hectare per annum over the life of a forest. A yield class of 20 means that 20 m³/ha/annum will be produced.

Source: Based on study by Coillte Teo. 1990.

The issue of whether job losses in agriculture can be compensated for by a development of forestry is a difficult question to answer. Because of underemployment in agriculture, forestry could occur without significantly increasing employment in rural areas. Therefore it would be misleading to view forestry exclusively in employment creation terms. Its main value lies in raising rural incomes and stabilising the population rather than in creating extra jobs. However in a recent unpublished study carried out by the authors (Kearney and O'Connor, 1993) it is shown that if 15 per cent of the area of the state (1,033,000 hectares) was planted to yield class 20 forestry the annual employment generated in the forests and the processing sector under a mature forest regime would be about 40,000 man years. Current employment in forestry and wood processing under existing production levels is about 6,000 people. In parentheses, it might also be stated that the above area of mature forest would generate a net income (after allowing for some reduction in agricultural output) of about £700m.

6. THE ECONOMICS OF PRIVATE PLANTING

Under the current forestry operational programme farmers have little difficulty in financing a forestry operation on part or all of their farms. They do not have to buy land; the planting grant covers 80 per cent of the initial costs and 100 per cent if they do the work themselves. Forest premia compensate for loss of farm income until returns from thinnings become available and very often these premia over-compensate because the land in current use in agriculture is producing very little income. No elaborate calculations are needed therefore to show that forestry on such land would give more profit than under present use.

The returns to a private planter who has to purchase the land are not so clear-cut. This planter does not receive the forest premium so that he has no income except the planting grant for the first 15 years. Problems can thus arise in relation to loan repayments. Few if any lending institutions will make a loan now to be repaid entirely in 15 or 20 years time. Institutions generally demand interest and sinking fund payments at weekly, monthly, 6 monthly or yearly intervals over the period of the loan. For this reason a person short of money could not buy land and undertake a forestry programme. Because there would be no money available for at least 15 years the planter would be unable to repay the instalments as they fell due.

We consider therefore the case of a planter who has his own or a client's money to invest in forestry. This person or company usually has a number of investment opportunities available. The small investor has the option of putting his/her money on deposit in a bank or building society while larger investors have opportunities for investing in property, equities or government bonds. Forestry has to be able to give returns similar to or better than those if it is to be considered.

The costs and receipts from a hectare of forest are given in Table 4. In arriving at these figures the following assumptions are made:

1. A Sitka Spruce forest of yield class 20¹ is selected with a reduction of 15 per cent for roads and other open spaces. The forest rotation is 40 years.
2. The cost of the land is put at £1,100 per hectare. This is the price for such land calculated in O'Connor and Conlon, 1993.
3. The planting grant available is £906 per hectare of which three quarters is paid on completion of planting and the remainder 4 years later.
4. All work is done by contract labour and paid for when completed.
5. The road through the area is constructed in the 14th year prior to the first thinning.
6. All timbers, including thinnings, are sold standing. Harvesting, extraction and haulage are done by the purchaser of the timbers.
7. Both timber and cost items are valued at constant prices over the life of the forest.
8. The timber prices used are those ruling for the 5 years 1988-1992 raised to 1992 prices. These prices are pulpwood: £6.2/m³, palletwood: £16.8/m³ and saw logs: £30.6/m³ (Communication from Coillte Teo.)

Table 4 shows that if the value of the land at the end of the period is omitted, total receipts over the 40 year life of the forest are £15,148. If the value of the land (valued at the same price as at the beginning) is included the total value of the receipts is £16,248. Total expenses including the value of the land are £3,844 giving a difference of £12,404. This difference has, however, very little meaning since the bulk of the receipts are received 30-40 years hence while most of the costs are incurred in the early years.

The detailed annual streams of costs and receipts can be used to calculate the internal rate of return (IRR) on the forestry investment. This works out at 6.6 per cent per annum which is a real rate over and above the inflation element in future prices. The receipts in Table 4 include the planting grant. If this was omitted the IRR would be 5.1 per cent. As stated above the prices used for timber were the average of those obtaining in the years 1988-1992. Had 1992 prices been used the IRR would have been 6.0 per cent including the planting grant and 4.5 per cent if the grant were omitted.

We can also determine from the data the maximum price a planter could pay, either to rent or buy yield class 20 forestry land in order to make a real interest of any given amount on

the total investment. To do this we exclude from the calculations the value of the land and express all the other figures in present values using a discount factor equivalent to the real interest rate required.

Table 4: Costs and Receipts per Hectare of Sitka Spruce Forest over 40 year Rotation

No. of Years	Costs						Receipts				Total Receipts
	Land and initial costs	Maintenance	Insurance	Brushing/ marking	Roads	Total Costs	Grants and Land	Thinning/felling			
								Pulp wood	Pallet wood	Saw Logs	
1-3	1,902 ⁽¹⁾	42	8	-	-	1,952	680	-	-	-	680
4-12	-	126	38	-	-	164	226	-	-	-	226
13-15	-	42	18	135	320	515	-	69	-	-	69
16-20	-	70	50	35	50	205	-	285	228	-	513
21-25	-	70	88	35	50	243	-	211	400	52	663
26-30	-	70	100	35	50	255	-	116	543	260	919
31-35	-	70	100	35	50	255	-	90	628	2,055	2,773
36-40	-	70	100	35	50	255	1,100	184	928	8,193	10,405
Total	1,902	560	502	310	570	3,844	2,006	955	2,727	10,560	16,248

Note: (1) Land £1,100; Preparation £150, Plants and Planting £300, Fencing £117, Fertilisation £93, Weeding £142.

Source: Based on study by Coillte Teo 1990 (op. cit.).

Using a discount rate of 5 per cent we discover that the present value of total receipts is £3,448 while that of total costs is £1,568 giving a net present revenue (NPR) of £1,880. Because the cost of the land has not been included in the calculations the NPR estimate can be interpreted as the amount one could afford to pay for the land at the real interest rate specified and still meet all outgoings, from the receipts (Convery 1979, op. cit.). Since yield class 20 land could be purchased in 1991 for £1,100 per hectare the NPR of £1,880 will more than cover the land price.

To determine the annual rent a planter could pay for land the net present revenue (NPR) is converted to annual equivalents using the following formula:

$$A = NPR \left[\frac{\frac{r}{100} \left(1 + \frac{r}{100}\right)^n}{\left(1 + \frac{r}{100}\right)^n - 1} \right]$$

Where: A = Annual Equivalent
 r = rate of interest and
 n = number of years of the rotation

Using again an interest rate of 5 per cent per annum the annual equivalent in this case is found to be £109.6. This means that equal payments of £109.6 continuing for 40 years are equivalent to having a lump sum totalling £1,880 now. This annual equivalent is, therefore, the amount which an investor could afford to pay annually, in real terms, for the use of the land for forestry over the rotation, and still cover all costs. Thus at a real rate of interest of 5 per cent, £109.6 per hectare per annum could be paid in rent for yield class 20 land for forestry purposes.

All of the above calculations are based on the assumption that costs will not exceed inflation rates, and receipts will keep pace with inflation. This appears to be a very heroic assumption. Forty years hence is a long time and much could happen in the meantime.

Looking at the cost items, and at the way productivity in the industry is increasing, some analysts would argue that costs could lag behind inflation. This could very well happen in the harvesting and processing sectors where labour is being replaced by very sophisticated machinery. On the other hand forest work, such as planting, weeding, fencing and marking is likely to remain fairly labour intensive, and for that reason the costs of operation up to the sale of standing timber are likely to move in line with inflation.

Timber prices are more problematic. Because many of the great natural forests in the USA and Canada are being conserved the world supply of timber is likely to remain tight with a consequent rise in prices. This price rise, however, will tend to stimulate the use of substitutes causing demand for timber to slacken so that prices should again return to their long-term trend.

The measurement of this trend is not straightforward and quite different price indices could be produced depending on the base year or years selected. If a high price period is taken as a base the trend may be less than that of inflation whereas if a low price period is selected the opposite will be the case. A study carried out by the authors using CSO prices has shown that between 1975² and 1991 wholesale timber prices to base 1975 = 100 rose to 368.7. Over the same period the consumer price index to base 1975 = 100 rose to

418.3. Timber prices therefore did not keep pace with inflation over this period. However in 1975 economic conditions were fairly buoyant but more importantly there was very steep inflation in the late 1970s and early 1980s. Timber prices lagged seriously behind inflation in these years and have not caught up since.

Looking at long-term trends a paper by the Allied Irish Bank (1992, Forestry Investment for Pension Funds) shows that USA timber prices since 1800 have increased by 1.5 per cent per annum in real terms and since 1910 the price of standing coniferous trees has increased by 3.3 per cent per annum in real terms. In the UK the price paid for coniferous sawn timber increased by 1.6 per cent per annum in real terms between 1920 and 1986. As Irish timber prices were not available to the authors for years prior to 1975 we were unable to calculate a long-term trend for such prices. An examination of some older CSO prices, which included furniture, would indicate however that between 1953 and the present time Irish timber prices kept fairly well in line with the consumer price index.

Over the long term, therefore, it may not be wildly inaccurate to assume that timber prices and costs will move more or less in line with inflation, but of course with ups and downs according to the business cycle. One of the most useful things about forestry in this regard is that growing timber is not a perishable commodity and harvesting can be accelerated or delayed depending on the market and on the growers' cash flow situation. Thus if timber prices are good a Sitka Spruce forest can be clear felled from 30 years onwards whereas if prices are depressed clear felling can be delayed or slowed down until prices recover. This is happening at the present time. Sawn timber prices have been depressed but timber producers are not prepared to accept greatly reduced prices and there is somewhat of a stalemate in the industry with harvesting curtailed and short time being worked in the saw mills.

7. SUPPLY AND DEMAND FOR TIMBER

World production of wood is estimated at about 3.5 billion m³ of which about 45 per cent is used as fuelwood. A further 40 per cent is used for industrial processing (sawlogs, pulpwood). Nearly three-quarters of industrial output originates in the countries of the north temperate zone. The three principal inter-regional trade flows are from Canada to the US, from the Nordic countries to the rest of Europe, and within the rest of Europe. The latter group accounts for nearly half of the total world imports while Canada is the largest exporter followed by the Nordic countries, the US and South East Asia. There are reports of a possible increase in supplies in the former USSR but these could be affected by the particular adjustment problems now being experienced in that region.

Arnold (1991) has indicated that there is a long-term reduction in the trend in global production which reflects changes in other variables in addition to economic changes.

These are mainly due to improvements in wood processing technology and substitution within the range of wood products themselves. The net result is a progressive shift from solid wood to reconstituted wood and wood fibre products while the aggregate consumption of sawnwood is growing only slowly. Growth in consumption of panels is slowing down but paper and paperboard consumption has been growing strongly. Arnold summarised the results of four recent global projections of demand for industrial wood. Projections range from a growth of 15 per cent to 40 per cent to the year 2000 and by 35 per cent to 75 per cent over 50 years. Further demand for sawnwood will grow more slowly than demand for products, as technology and increasing processing efficiency continue to extend the use of timber.

On the supply side there is an increasing trend towards raising the proportion of raw materials for further processing that comes from logging, sawmilling, other residues and from recycling of paper. In the US and Europe most available residues are now in use.

With respect to future supply, net increments have exceeded removal so that the volume of growing stock has been increasing in the north temperate zone. The opposite is the case in tropical regions. During the coming decades there will be a major shift in global production also from old growth to planted and managed forests which could have implications for the quality of wood supplies.

Though the tropical resources will continue to decline the larger and expanding temperate resources can support expansion of supplies in line with projected global demand without appreciable price increases. However, all the international studies suggest a continuing but slow growth in roundwood and a slower growth still in the prices of products. With respect to trade the two largest importing regions of Western Europe and Japan could become more self-sufficient and parts of the developing world less sufficient. A final point in this context is that much of the additional roundwood supplies which will become available in Europe in the next few decades will be in regions in which there is not at present a corresponding industrial processing capacity.

The European Community as a whole has a major deficit in timber. The situation for production and consumption is shown in Table 5.

The self-sufficiency for the EC is about 53 per cent and ranges from 240 per cent or a major surplus in Portugal to a major deficit in the UK where only about 11 per cent of requirements are produced domestically.

Table 5: Supply/Demand Balance for Timber ('000m³)

EC Countries	Production ^(a)	Consumption ^(b)	Deficit/Surplus	Percentage ^(c)
Belgium	2,648	5,506	-2,858	48
Denmark	2,947	5,223	-2,276	56
Germany	28,160	45,850	-17,690	61
Greece	2,423	4,309	-1,886	56
Spain	14,098	15,478	-1,380	91
France	30,081	40,569	-10,488	74
Ireland	1,100	2,175	-1,075	51
Italy	8,308	25,631	-17,323	32
Luxembourg	251	173	+78	145
The Netherlands	894	10,565	-9,671	8
Portugal	8,278	3,449	+4,829	240
United Kingdom	3,940	34,464	-30,524	11
EUR-12	103,128	193,392	-90,264	53

Notes: (a) = Production without bark,
 (b) = Round wood equivalent,
 (c) = Self-sufficiency percentage.

Source: *The Agricultural Situation in the Community, 1991 Report*, CEC.

In consequence the EC has a major external trade deficit in timber products, largely in sawn timber, paper and board, and pulpwood. In financial terms this was equivalent to a trade deficit of almost 23 billion ECU in 1990 (CEC 1992).

As indicated above the UK is only 11 per cent self-sufficient in forest products. It is likely therefore to be the main outlet for the Irish wood and wood products industry in the future. In an appraisal of the UK demand for and supply of wood and wood products, Whiteman (1991) says that, since only a small amount of internal demand is produced domestically it was assumed that price has no impact on supply. Demand was analysed on the basis of 11 product categories and a range of independent features was examined which included industry, own price and substitute price variables. The most likely supply scenario is that UK wood production will expand until 2025, to an annual production of 20 million m³ and then contract until 2040 after which production will increase from the next rotation. With a high growth scenario the demand is projected to rise steadily to about the equivalent of 74 million m³ by the year 2025 and at a slower pace to 91 million m³ by 2050. The respective levels of demand with a lower growth rate are 66 and 70 million m³ respectively. In both instances the bulk of the increase is accounted for by paper and paperboard. In both scenarios however the UK would continue to be the major wood importing country in Europe.

8. IRISH TRADE IN WOOD AND WOOD PRODUCTS

Irish trade in wood and wood products is grouped into five divisions (1) cork and wood, (2) pulp and wastepaper, (3) cork and wood manufactures (excluding furniture), (4) paper, paperboard and articles thereof and (5) furniture and parts thereof. The trade in 1980 and 1991 in these products is shown in Table 6.

The first four divisions are grouped together as they are the main products of the wood processing industry while the furniture division is quite a separate division often incorporating non-wood products. For the four divisions grouped together the trade balance was in deficit by £403m in 1991 of which paper and paperboard accounted for almost 85 per cent, having risen from 57 per cent in 1980. The main reason for the rise in this ratio is that while the coverage of imports by exports for this division has changed little from 1980 to 1991 (about 20 per cent) the coverage of imports by exports has risen appreciably for the other two main categories; from 8 per cent to 44 per cent for cork and wood, and from 17 per cent to 70 per cent for cork and wood manufactures. The main items in the cork and wood category are imports of coniferous sawnwood principally from Sweden and Canada and non-coniferous sawnwood from certain African countries, Brazil and the USA. Imports of paper and paperboard and articles thereof constitute an extremely large element of imports with a negative trade balance amounting to £338m in 1991, and while, as indicated from both sections of the above table, exports have also increased significantly over the period, the export coverage has changed little. The trade balance for furniture has improved significantly, however, from an export/import coverage of 40 per cent in 1980 to 71 per cent in 1991.

Table 6: Irish Trade in Wood and Wood Products, 1980 and 1991 (£m)

Wood Products	1991			1980		
	Imports	Exports	Balance	Imports	Exports	Balance
Cork and wood	66.8	29.3	-37.5	59.0	4.7	-54.3
Pulp + waste paper	10.0	3.6	-6.4	8.1	3.4	-4.7
Cork and wood manufactures (exc. furniture)	71.0	49.5	-21.5	36.8	6.3	-30.5
Paper/paperboard	426.3	88.3	-338.0	148.5	29.3	-119.2
Total	574.1	170.7	-403.4	252.4	43.7	-208.7
Furniture etc.	96.0	67.7	-28.3	38.9	15.5	-23.4
Grand Total	670.1	238.4	-431.7	291.3	59.2	-232.1

Source: CSO, *Trade Statistics*.

As pointed out in a Forest Service publication *The Case for Forestry* (1983) Ireland has a relatively low utilisation of timber per capita expressed in WRME (wood raw material equivalent) terms. At present Ireland is estimated to have a crude self-sufficiency ratio of approximately 65 per cent in wood production, but given the usual mix of consumption of wood products in Ireland, outward and inward trade will always be a feature of the Irish timber industry. Irish sawmills have about a 55 per cent share of the Irish home timber market including 100 per cent of the pallet/fencing market and 60 per cent of the construction timber market. The production of wood by Coillte in recent years is shown in Table 7.

Table 7: Trends in Timber Production, State Forests, Million m³

Year	Sawlog	Pulpwood	Total
1988	0.780	0.630	1.410
1989	0.845	0.658	1.503
1990	0.906	0.538	1.444
1991	1.010	0.527	1.537

Source: Coillte Teo., *Annual Report and Accounts, 1991*.

The forecast production is 3 million m³ of commercial timber by the year 2000. Coillte estimates that the existing forest estate will reach sustained yield before the year 2010 when its timber production will increase to 4.5 million m³ per annum. At this stage Ireland will have significant volumes of construction timber and products for pulp and paper production and wood-based panels. In addition it is estimated that private forests produce an extra 90,000 m³ of commercial timber each year and will thus be making a further contribution to industry outputs at this time.

Based on statistics in the Forestry Operational Programme (FOP) 1989-1993 (1991) the main market for roundwood consists of 100 sawmills and two pulpwood using mills. The sawmills use about 0.75 million m³ of timber each year but 18 of them account for about 70 per cent of consumption. The two pulpwood mills are the MDF plant in Clonmel and the chipboard plant in Scariff which consume both round pulpwood and residues from the mills. The market destination of the output of these mills is shown in Table 8. There is also a demand for timber for poles, firewood and fencing, while Christmas trees and foliage also attract significant markets.

Table 8: Markets for Irish Forest Products

Market	Ireland	United Kingdom	UK/Europe
		Per cent	
Sawmills	75	25	-
Medium density fibreboard	5	-	95
Chipboard	75	25	-

Source: *Forestry Operational Programme (FOP), 1991 op. cit.*

9. CONCLUDING REMARKS

The Irish forestry industry is entering a new phase with complementary emphasis now being devoted to the development of the processing sector. The afforestation programmes of the 1940s and 1950s are now yielding increasingly significant volumes of timber. These will in time absorb the existing capacity of the sawmilling, pulping, and wood-panelling sectors. New investments will soon be required in the processing and marketing sectors and supporting infrastructures. In the first instance, the sawmilling sector is in need of restructuring while plans must be put in place for further development of panel manufacturing facilities including Oriented Strand Board production. Additional pulp processing capacity will also be required to fully utilise all the pulpwood from the forests and residues from sawmilling. At the same time the competitiveness of the Irish timber industry must be kept under scrutiny particularly stumpage costs, labour productivity, residue prices, and the capacity utilisation of the industry. As pointed out elsewhere (Simons Report, 1991) the opportunities for improving competitiveness must include increasing volume, grade, and value recovery, an improvement in product quality, a reduction in manufacturing costs and a greater focus on R & D and new generation technologies. The focus which hitherto has been placed on the competitiveness of the wider manufacturing sector in the Irish economy must now be directed towards the Irish timber industry with respect to the domestic and export markets. Indeed, in our view, the forestry and wood industry as a whole is in need of more attention from economic and market analysts especially given its strong expansionary character in the years ahead. It is vital that the industry be strategically planned so that the financial and physical resources which are now being directed to afforestation yield adequate returns to the economy and society at large in the longer term.

Not alone is forestry now being actively pursued to provide raw material for a forest based industry but it is also promoted to diversify the rural economy and stimulate rural development in the context of CAP reform. We have shown that there is no evidence of any conflict between a modest expansion in forestry and agricultural production and indeed a further substantial area of land could be released from agriculture without severely impairing agricultural output or incomes. However, there is still a considerable degree of residual hostility towards forestry either for historical reasons or from a perception that afforestation severely circumscribes the opportunity cost of land. Other things being equal however, it seems that the expected returns from forestry must show a premium over the returns from using the land for agriculture before landholders will seriously consider the forestry option. The scale of this premium probably varies with the prevailing socio-economic circumstances and planning horizons of the individual concerned.

The achievement of any given rate of afforestation depends, of course, on prevailing economic circumstances as well as on the particular policy mix directed towards rural development. The recent CAP reform market regime measures, in the absence of adjustments to the forestry incentives, probably retard expansion in forestry by increasing agricultural returns and raising land prices. A particular feature about land prices is that incentives to encourage private afforestation tend to become capitalised into land values while the removal of farmland from agriculture tempers the extent to which farmland values fall.

The particular policy mix can also contain internal conflicts and contradictions. For instance the receipt of social welfare payments impedes afforestation, even on near derelict holdings, while other CAP-related measures, like the extensification and the agri-environment schemes, will tend to offset the effect of the forestry incentives.

While one cannot be too definitive, it may be difficult to achieve and sustain the rate of afforestation which has been achieved in recent years. In the first place, the response to the new planting incentives was possibly at its maximum after their introduction and would be expected to gradually taper off, requiring even greater incentives to maintain any given rate of planting. Second, the outlook for agriculture may be less pessimistic than previously realised and the resilience of farmers can often be underestimated. Third, while the current high unemployment and weak labour market persist, there will be less restructuring and rationalisation in land ownership and use than would otherwise occur.

Taking account of the implications of recent price/market and socio-structural policy adjustments, the future forestry programme may present a more formidable challenge than its immediate predecessor. The planting programme is likely to display a less regular pattern while the shift in the composition of planting as between the public and private sectors may not be sustained.

One final point should be made. Under current planting policies we rely very heavily on one species - Sitka Spruce. This is dangerous both from a biological (disease) and a business perspective. In future years the planting grants and forest premia should be adjusted to make for a more diversified species regime.

Footnotes

1. For definition of yield class, see footnote to Table 3.
2. The CSO timber price index does not go back beyond 1975.

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DISCUSSION

J. Gardiner: (UCD) In proposing the vote of thanks to the speakers, I would like to compliment them on a very balanced presentation. He said:

I have no difficulty in agreeing with most of what they had to say and so I will confine my remarks to some comments relating directly or indirectly to the paper.

1. The authors give a brief review of forest development and forest policy over the first few pages. Broadly, I would say that they do not overstate the downside policy problems which forestry and foresters in Ireland faced during the period 1955-80. During this period the Land Commission had a virtual (if not absolute) veto on land acquisition for forestry purposes, and land which might be useful for agricultural purposes could not be acquired for forestry. The fixing of a maximum price which could be paid for land, effectively ensured that only the poorest quality land (unfit for agriculture) could be acquired for forestry. Voluntary acquisition made it exceedingly difficult to obtain and develop large tracts of land. The net result is that in the period 1955-1980 the forest estate grew by approximately 9,000 hectares **per annum** - but this is organised in over 200 forests, with each forest consisting of several to many separate blocks. This makes operational management very difficult and creates a major logistics problem at the harvesting phase. The direct contrast is with the major forest areas and industrial complexes in the USA, New Zealand and Chile. In these countries the forest industry tends to be completely integrated, with the forest companies owning and managing huge tracts of forest (often in the region of 50-100,000 ha). In these situations the sawmills, pulpmills etc. are usually situated within the forest, with private roads leading to the processing plant.
2. Since 1980, new EC incentives have resulted in major expansion in private planting. Many farmers have become involved by planting portions of their land marginal for agriculture. These farmers are generally paid an annual premium which is not shown by the authors in their cash flows and NDR calculations. These early annual payments bring about dramatic changes in both. Hence, the financial statements do not show the true picture for farmer participation in forestry. However, it should be also noted that block size in farmer afforestation is quite small (average 8 hectares) and this may lead to increased costs as well as marketing difficulties. Perhaps we should be thinking in terms of scaled planting grants and premia payments as an inducement to increase block size.

3. The authors note that 90 per cent of our forests are made up of coniferous species and base all of their calculations on Sitka Spruce crops. I think it is a pity that they did not show cash flow, NDR and IRR for a crop such as oak, with a rotation of about 120 years, because the results would have clearly demonstrated the difficulty of attracting investment in hardwood crops.

4. In talking about the markets for wood and wood products we need to be extremely cautious. There is no doubt but that Europe will have an adverse balance of trade in wood and wood products for the foreseeable future. The stated objective of the forest authorities in Britain is to be in a position to supply about 25 per cent of their own wood product needs. But our main production at present is in low quality (low value-added) products such as pallets, stakes and construction lumber. British forestry grows the same species and produces the same products. It is not difficult to visualise those markets becoming saturated fairly quickly. To remain competitive, we must minimise our production costs and eliminate wasteful competition at home. Partnerships between the main grower and the processors appear to be essential in order to expand market share on the British market. In addition, we must in future break into the higher value-added end of the market which is the pulp and paper sector. This latter is, however, very capital intensive and it is doubtful if it can be achieved in the short-term.

With these few remarks it gives me great pleasure to propose the vote of thanks to the speakers.

John Bruder: I work for a company by the name of AIB Investment Managers whose function is to manage 3rd party client funds with a view to achieving the best return for a given level of risk. AIB Investment Managers acquired its first forestry investment property in 1979 in Tulla in East County Clare and since then on behalf of its clients it has assembled a portfolio comprising approximately 8,000 acres valued in excess of £10m. Forestry is very much a minor element in most client portfolios with for example our recommendation for a typical pension fund to hold approximately 1 per cent of a diversified investment portfolio in forestry.

Recent History of Irish Forestry

Since first becoming involved in 1979 I have witnessed a transformation in the forestry industry in Ireland both in the public and private sectors.

The public sector has been revolutionised by the creation of a commercial semi-state company Coillte Teoranta. Similarly, the private sector has seen dramatic growth in change

over the time. The total volume of the private sector planting in forestry when AIB first became involved was in the region of 200 hectares per annum. This has grown to a level of approximately 11,000 hectares per annum in the early 1990s with the investment institutions, who spearheaded the private sector forestry investment, now joined by a wide range of private individual developers and more recently by farmers and land owners.

Two particular individuals who have by their leadership ensured that the forestry industry has come this far are Sean McBride in the 1950s and Michael Smith in the 1980s. Sean McBride with a single mindedness and vision which some might describe as fanaticism succeeded in overcoming significant opposition to launch the first great expansion in modern Irish forestry in the 1950s.

Michael Smith as Minister for State in the 1980s succeeded in a short few years in transforming the state forestry centre from a branch of the civil service into a focused commercial business organisation.

Specific Points Relating to the Paper

- (a) The paper refers to the fact that Ireland has the lowest level of forestry cover in the European Community with just 6 per cent of our land area under trees relative to the EC average of 25 per cent. In fact if one extends the comparison to the whole of Europe outside the EC Ireland has in fact the lowest area under forestry of all countries in Europe with the exception of Iceland and Albania.
- (b) The paper refers to "considerable hostility" to forestry from farmers. In my view, while there was certainly considerable hostility from farmers towards forestry for a long period of time and indeed into the early and mid-1980s, this hostility has substantially abated since the mid-1980s due to a combination of factors, ranging from promotion and education to the substantially improved incentives targeted specifically at farmers to encourage them to plant their land. An incident I remember well, of forestry machinery being burnt at a place called Drumgowna Bridge in County Leitrim, is I feel very much less likely to happen in the current environment!
- (c) The main point which I have to stress in relation to the paper concerns the rate of return referred to in the paper as being available to the non-farmer investor in forestry, with a 6.6 per cent internal rate of return available, and if one sees both costs and revenues rising with inflation that return being a real rate of return. The difficulty here is that this is not a sufficiently commercial competitive rate to entice significant investment funds away from other asset areas. The bench mark used

by investors against which all asset areas must be measured is the government gilt market which has the characteristics of being risk free, management free, flexible and highly liquid. If an investor is to direct his funds away from Government gilts the return which the alternative investment offers must compensate him for the level of risk associated with that investment, the management input required, the flexibility or lack of, and the illiquidity. The characteristics of forestry mean that it is highly illiquid, relatively inflexible, requires ongoing management and carries a certain element of risk to the investor. While no significant work has been undertaken in this area, my view is that forestry needs to produce a return of between 3 and 5 per cent per annum in excess of that available from gilts in order for forestry to attract significant investment funds.

Notwithstanding the recent substantial decline in the rate of return produced by Government gilts this rate is still relatively high in real terms. At present gilts are yielding in the region of 8 per cent nominal or approximately 5 per cent real if one assumes a medium term average rate of inflation of 3 per cent. Therefore, if gilt yields remain at their current levels forestry will have to offer a return of between 8 and 10 per cent real in order to stand a chance. This is a substantial impediment to anybody attempting to promote forestry as a serious viable attractive alternative investment.

Issues Facing Irish Forestry

A significant point attributed to Professor Jack Gardiner which I would echo is the difficulty associated with the very small size of the average forestry holding in this country. This small size is going to be a substantial disadvantage in the management and more particularly in the harvesting of forest properties. In AIB Investment Managers we have adopted as a rule of thumb a minimum practical size of 100 acres for the smallest block of forestry. Any forest below this minimum size will not be considered by us for investment unless it is in close proximity to an existing holding so that we can pursue an element of "blocking up" or consolidation of holdings. Even 100 acres is a very small minimum size when compared with our international competitors in Scandinavia, North America and even Scotland where typically forests are measured in thousands or tens of thousands of acres. The very small size of Irish forests will become a greater disadvantage in the future with the substantial progress in the use of technology and mechanisation in harvesting properties. The mechanisation is most suited to large forests.

Another issue confronting Irish forestry is the degree to which the focus in the industry must now shift from silviculture to marketing and product development. For the past 30 to

40 years the main business of the industry has been establishment and management of forest crops. Now that the output from our forests has commenced rapid growth, we will as an industry need to focus very much on identifying target niche markets and devising marketing strategies to exploit these opportunities in full. This requirement for a marketing focus is all the greater given the cost disadvantage that we face in the international markets due to such factors as lack of economies of scale etc.

A final point I would make is the exciting potential there is in my view for Irish forestry attracting substantial overseas investment. There is no doubt that Ireland must be an attractive location for overseas (and in particular European) investors given our relative comparative advantage with regard to the production of commercial soft wood timber and given also that we are one of the very few European countries with substantial growth potential in terms of the scale of our afforestation. There is furthermore the significant opportunities in the processing sector given the substantial rise in the output of our forests projected for the next 10 to 15 years.

The authors are to be congratulated on producing an excellent paper which captures the essence of the subject matter in a marvellously comprehensive way.

Reply by Robert O'Connor: Professor Gardiner's comments are of great interest and help to put the marketing of our timber in context. He also makes a number of suggestions which gives us ideas for further research in the forestry area, in particular the problems associated with small scale forestry. As explained in the paper we did the internal rate of return for an investor purchasing land for forestry. Such an investor does not receive the forest premium.

I also wish to thank Mr Bruder for his very kind remarks. He also made a number of interesting comments from the investors' point of view. He made one point however which puzzled me somewhat. He said, that because of the low rate of return, forestry is not sufficiently competitive to entice significant investment funds away from other asset uses. Yet in a later statement he says that there is a potential for Irish forestry attracting overseas investment. If the monetary returns are not attractive for Irish investors it is difficult to see how they could be so for foreigners. There must be other non-monetary advantages.