The Impact of Forestry on Rural Communities

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A report prepared for

The Forest Service (Department of Agriculture, Food and Forestry), Coillte Teoranta and the Irish Timber Growers Association under the EC funded Forestry Operational Programme, 1989-1993.

By The Economic and Social Research Institute

Copies of this paper may be obtained from The Economic and Social Research Institute (Limited Company No. 18269) Registered Office: 4 Burlington Road, Dublin 4.

Price IR£6.00

May 1993

Acknowledgements

The authors wish to acknowledge the support of a Steering Group appointed to monitor the progress of the study and make comments on successive drafts. The Steering Group consisted of Dr Niall O'Carroll, Chief Inspector, and Mr Denis Mehigan, Forest Service, Dr Gerhard Gallagher, Coillte Teo., Mr Brian Hussey, Chairman, Irish Timber Growers Association, and Mr Tom Arnold, Department of Agriculture, Food and Forestry.

We are also grateful to the following ESRI staff: Professor Brendan Whelan and the members of the Survey Unit who conducted the field survey and processed the data; Dr Rory O'Donnell and Dr Tony Fahey, ESRI, who commented on earlier drafts and made valuable suggestions; and Ms Mary Cleary and the staff of the General Office who typed the various drafts.

None of the above is responsible for the final manuscript, and any errors or omissions therein are the sole responsibility of the authors.

CONTENTS

List of Tables

Appendix Tables

List of Figures

SUMMARY

This study set out to indicate the extent to which forestry can contribute to rural development especially in the context of large scale migration from a marginal farming area; it also briefly treats how CAP reform affects the returns from conventional farming and how it might affect afforestation.

Nationally Ireland has the lowest proportion of its land area under forestry of any Member State in the EC where forest as a proportion of total land area varies from about 6 per cent in Ireland to 45 per cent in Greece. The Forestry Operational Programme, 1989-1993, has a national annual planting target of 30,000 hectares by 1993 as against 15,000 in 1988. The recent CAP reform proposals could affect these targets.

One of the main effects of these proposals is that the returns from the single suckling system, which is the dominant cattle system on the medium to poorer quality soils, will actually increase unless cattle prices decline beyond that anticipated in the CAP reform, i.e., 15 per cent. However, returns from sheep production could actually decline while any further expansion is effectively curtailed. The EC extensification premium scheme could, however, have the most serious effect on forestry expansion. Under the programme, farmers are given extra payments on beef cows and male cattle over 10 months of age if their overall stocking rates are less than 1.4 livestock units per hectare of forage crops (including grassland). Putting land under forestry and carrying the stock on smaller areas could thus breach the stocking rate limits and render some farmers ineligible for the premia. It is shown, however, that up to one million extra hectares of land, yielding very little in their present use, could be put under forestry without breaching these limits.

A field study was carried out in 1992 which compared a normal forest area as represented by the Aughrim district of Co Wicklow with a marginal farming area on the Mayo/Roscommon border, which has suffered severe depopulation, with little forestry activity but with good potential for forestry. In describing the survey results these areas are referred to as East and West respectively.

Official statistics from the CSO show that the East and West study areas have land areas of 15,482 and 14,993 hectares respectively and a 1986 population of 2,149 and 3,074 respectively. There is a very interesting contrast between the two areas in respect of population trends. Though the population of both areas was in decline up to 1961 the trend reversed thereafter in the East region and was back almost to its 1926 level by 1986. By contrast the population decline was considerably more severe in the West area and the decline has persisted. In consequence the population of the latter area has fallen by 62 per cent between 1926 and 1986. Though a number of hypotheses could be adduced to explain the difference in population trends it seems probable that forestry played a major role in stabilising the population in the East region.

Both areas are predominantly rural in character. After forestry, hill sheep farming is the major enterprise in Wicklow while cattle farming is the dominant enterprise in the West.

A sample of 570 names was drawn from the Register of Electors as a basis for identifying households and their characteristics in the field survey; the number of household questionnaires completed was 217 for the East and 248 in the West.

The household data was analysed with respect to their demographic, social and economic characteristics and comparisons drawn between the two areas.

The major difference between the areas with respect to the *economic status* of the populations related to the proportions classed as unemployed and at work; a significantly higher proportion of the heads of households in the East were unemployed, partly due to the lower proportion of farmers in the area. Farmers never report themselves as unemployed though they may be very underemployed.

Only 27 per cent of the households in the East had farm holdings while 61 per cent in the West were in this category; the proportion of land holders declaring themselves as primarily working on their farms varied from 74 per cent in the East to 67 per cent in the West.

The importance of forestry in the East by contrast with the West is clearly evident in the occupational structure and household incomes in the area; this derives from the fact that only about 4 per cent of the land area is afforested in the West with relatively immature trees, while about 22 per cent of the Wicklow area is forested and is broadly representative of a mature forest area.

Income figures are difficult to assess in small areas such as these because many of the people resident in the areas work in other areas while many people employed in the areas are resident elsewhere. For the purpose of comparing incomes in the two areas we omitted the incomes of residents working outside the areas and included those of non-residents working in the areas. In addition, we included estimates of business profits generated in the areas but accruing to non-residents.

On the basis of this income definition it was found that forestry accounted for 39 per cent of income arising in the East compared with 0.8 per cent of that in the West. Agriculture made up only 11.7 per cent of income arising in the East compared with 21.8 per cent in the West. State transfers made up 48.2 per cent of the western income compared with 28.5 per cent in the East. Average income per head of the population 15 years of age and over was £6,722 in the East compared with £4,187 in the West.

There are large differences in the attitude to forestry in the respective areas with considerably more in favour in the East than in the West; the dominant reason given in the latter area by those opposed to forestry was that it was inimical to the development of agriculture and could cause depopulation and isolation.

The survey indicated that there was no strong inclination to plant or sell land for forestry in either area in the immediate future. However, discussions with Coillte and private forestry personnel in the Western area revealed that land for forestry was becoming available at an increasing rate in recent years.

A calculation was undertaken to show the effect of increasing the forestry area in the West region. Assuming that 25 per cent of the land area in this region was under mature forest, it was estimated that annual agricultural incomes in the area would decline by £110,000 but income arising in forestry (including timber processing) would increase by about £3 million. As a result, other things being equal, the average income of persons 15 years of age and over in the West would rise from £4,187 to £5,448. The percentage of income arising in forestry would increase from 0.8 per cent to 24.7 per cent.

Under the new regime agricultural labour in the area would decline by 104 man years from 49 per cent of the total labour force to 39 per cent. Forestry labour would increase by 152 man years from 1 per cent of the workforce to 16 per cent.

Forestry and Rural Development on a National Scale

The National Farm Survey (NFS) carried out annually by Teagasc shows that about 43 per cent of the grassland area in the state has a stocking rate, as defined by the EC for the extensification premium, of less than one livestock unit per hectare and is thus yielding very low income. The area involved is about 1.7 million hectares. Much of this land would be very productive in forestry.

Taking account of this fact we examined the implications for the rural economy of successively larger forest areas. The areas considered represented 10 per cent, 15 per cent and 20 per cent of the land area of Ireland which would be equivalent to 689,000, 1.033 million and 1.378 million hectares respectively. Because the additional afforestation would be occurring on "better" quality land the extra increments would have a successively depressing impact on agriculture.

The effects on incomes and employment of these forest areas in a mature forest situation are shown in Table S.1 When 10 per cent of the land is under forestry, the income arising over and above the present level is £168 million and the increased net labour requirement is 9,694 man years. This increased forestry area causes no reduction in agricultural output or employment. When 15 per cent of the land is put under forestry, extra income arising from the increased timber produced (over and above present income) is £437 million but this amount is reduced by a decline of £13 million in agricultural income as some good agricultural land is used to link up smaller forestry areas. The net income increase is thus £424 million. The extra labour required for the forestry operation is 25,200 workers but agricultural labour is reduced by 1,200 people so that the net labour requirement for this forestry increment (over and above present levels) is 24,000 man years.

When 20 per cent of the land area of the State is afforested the income generated by the extra 928,000 hectares is £706 million but this amount is reduced by £53 million as a result of a decrease in agricultural income, giving a net increase of £653 million. The extra net labour requirement is (over and above present levels) 36,400 workers, made up of 40,800 extra forestry workers less a reduced agricultural employment of 4,400 workers.

Table S.1: *Annual Income and Employment (over present levels) Generated by Extra Areas of Sitka Spruce Forest*

% of land area under forestry including current area of 450,000 ha	*Unit* *0%*	*10%*	*15%*	*20%*
Yield Class	-	18	20	20
Increase on Present Area	ha x 1,000	239	583.5	928.0
Annual Timber Production from this area	M^3 x 1,000	3,656	9,512	15,369
Additional Annual Net Value Added				
To factory gate	£000	110,173	285,853	461,533
In processing	£000	58,193	151,531	244,869
Annual reduction in Agricultural Income	£000	-	-13,000	-53,000
Annual Total Net Value Added	£000	168,366	424,384	653,402
Net labour requirement	Man years	9,649	24,031	36,368

The increased number of workers required for the forestry programme would not necessarily increase the combined agricultural and forestry national labour force. The farm labour force is declining at a rate of 3 per cent per annum and this trend is likely to continue. A forestry programme could help to stem somewhat this rural decline but it cannot halt it entirely. There is still too much under-employment in agriculture for this to happen.

Having said this, however, there would undoubtedly be a significant improvement in rural incomes from switching unproductive farm land to forestry. Even a small increase to 10 per cent of the land area under forestry would be very worthwhile. This area of mature forest would give an annual increase in Net Domestic Product of about £168 million and would require a labour force of about 10,000 people.

It should be kept in mind that the results presented in this paper relate to mature forests. For a current planter, however, maturity is 40 years down the road and a lot could happen in the meantime. Substantial incentives are needed therefore to get a forestry programme undertaken by private people. The increased planting grants, the forest premia and the tax concessions available are such incentives but it could well be that further enticements are needed. At current rates of planting it would take 50 years to achieve a forest domain of 20 per cent of the land area of the State and a further 40 years before a mature forest area of this size would be available. This is a scenario which is difficult to comprehend, but if a policy decision is taken to achieve such a level of forestry at an earlier date, plans must be made now.

Timber prices must also be considered. In this study we have used average prices for 1988-1992 raised to 1992 levels using the Consumer Price Index. Over most of this time timber was in strong demand. Had we used current depressed prices the results would not have been so favourable.

Looking towards the future, however, the outlook is optimistic. Timber is an essential ingredient in the building industry which waxes and wanes with the business cycle. At the present time building in the developed countries is in the doldrums but when economic

conditions improve, as they inevitably will, it will take off again and demand for timber and prices will increase. Planters can be assured therefore that over the long run, despite periodic hitches, timber prices will increase in line with inflation and probably at a greater rate as traditional forests in the USA, Canada and the Scandinavian countries, become less available.

In any case there is an urgent need to increase afforestation in Ireland where up to one million hectares of land are producing very little in the way of agricultural output. Most of this land is eminently suitable for forestry and it should be put to productive use as soon as possible. However, the Forest Service and Coillte must take a hard look at current planting practices. The current over-reliance on one species - Sitka Spruce - is dangerous from an environmental, biological (disease) and business point of view. In future years planting grants and forest premia should be tailored to obtain a more diversified species planting regime.

Chapter 1

INTRODUCTION

The Programme for Government, 1989-1993, identified forestry as having the potential to make a major contribution to regional and economic development, and as a measure to assist in achieving the objectives of the reformed structural funds (National Development Plan 1989-1993, 1989). The Forestry Operational Programme is covered under the Community Support Framework for Ireland, adopted by the EC Commission on 31 October 1989. The programme covers the period 1 January 1989 to 31 December 1993. The contribution from the EAGGF, Guidance Sector, for financing the programme was fixed at up to 70 per cent of the national contribution and not to exceed 64.8m ECU in constant 1989 prices.

The main objective of the Forestry Operational Programme (FOP, 1991) is to contribute to the generation of wealth in the Irish economy by utilising available and suitable land and human and financial resources to the best advantage in creating new, and developing existing forests. This in turn will:

- provide the raw material base for an expanded and improved forestry based industrial sector;
- diversify the rural economy;
- stimulate rural development;
- provide employment and,
- promote the reform of the agricultural sector.

The programme provides measures which will:

- expand significantly the forest base, the target is to double tree planting to 30,000 hectares per annum by 1993 as compared with 1988;
- encourage forest owners to improve existing woodland and reconstitute forests damaged by fire, storms or other natural causes;
- promote the economic exploitation of existing forests by building forest roads and encouraging investments in harvesting; these measures will help increase the annual timber output from Irish forests by some 33 per cent in the period of the programme and,
- act as a back-up for the main proposals; supporting measures will include aid to associations, studies, pilot projects and publicity campaigns which will be mobilised to promote the programme.

The six major measures in the programme are briefly as follows:

1. *Afforestation:* grants are available in all areas of the state and cover afforestation of land suitable for forestry, and associated activities including ground preparation, drainage, fencing and fire protection.
2. *Improvement of woodland:* this measure is directed mainly towards broadleaved or mixed plantations and grants are provided to encourage the conversion of degraded woodland to productive forest.
3. *Reconstitution of woodland:* this measure is designed to encourage the reconstitution of woodland which has suffered damage from fire, windblow, or other natural causes, by the provision of support towards the cost of re-establishing the damaged plantation.
4. *Forest roads:* grants will be provided to cover the construction or upgrading of forest roads to facilitate development and harvesting.
5. *Forest harvesting:* this measure is designed to improve efficiency and grants are available towards investments in machinery for felling, processing, harvesting, and extraction of timber.
6. *Back-up measures:* grants are available for studies/pilot projects, and for associations of persons exploiting woodland.

The Forestry Operational Programme is supplemented by two other major programmes to promote regional development. The Forest Premium Scheme provides for the payment of annual forest premium payments to farmers who afforest land. The Operational Programme for Rural Development includes forestry measures which support recreational forestry, forest nurseries, back-up farm forestry services and forestry training.

Further details on grant levels and general conditions associated with these three schemes are given in Appendix A.

Terms of Reference of Study

In the Autumn of 1991 the Forest Service of the then Department of Energy, in co-operation with Coillte and the Irish Timber Growers Association, agreed to fund a study concerning the impact of forestry on rural communities. The purpose of the project is to study the extent to which forestry development can replace a crumbling small farm structure in many parts of Ireland. Rural population decline in recent years is now a very serious problem. At the same time substantial areas of wet mineral soils on lowland areas are producing little if any agricultural output or income and it is established that these lands are highly productive for growing trees. It remains to be demonstrated how and to what extent a forestry programme on such land could provide a viable social structure based on village and community living.

South Wicklow is an example of an area where forestry has become an integral part of the rural fabric. The economy of a number of towns and villages in this region is based substantially on a thriving forest sector. The Slieve Bloom region in Co Laois is another such area. The study set out to compare the economy of one of these areas with a similar sized lowland area where a forestry programme of any magnitude has only recently commenced and where there is little if any manufacturing industry. The aim was to compare land use, occupational structures and approximate income arising in the two areas at the present time, and then to show the effect on incomes and employment of a forestry programme on about

25 per cent of the land in the control area using coefficients derived from the mature forested region. Finally, using data from both of the study areas we show the effect on income and employment in the State from a forestry programme covering about 20 per cent of the State's land area.

In order to provide background information for the study the report describes briefly:

(1) land use patterns and forestry in Ireland compared with other EC countries, and
(2) the effect which the reform of the CAP may have on forestry development in Ireland.

Chapter 2

LAND USE PATTERNS AND FORESTRY IN IRELAND AND EC COUNTRIES

The total land area of Ireland is 6.889m hectares, having changed little over recent decades. The evolution in the total land area and its components over the past 20 years is outlined at 5-yearly intervals in Table 1. Total tillage area has fallen by about 22 per cent in the past 20 years but the bulk of the decline has arisen in the "other tillage", or its root crop component, having almost halved over the period. The decline in the tillage area has been heavily concentrated in the Western and North Western areas of the country and these areas have almost wholly been diverted to grassland. Tillage farming now represents less than 2 per cent of the utilised agricultural area in the West and in some rural districts in Western and South Western counties it is practically non-existent. While the area of grassland conserved has risen by over 40 per cent, the combined area of conserved and pasture land has changed very little over the years which suggests some land hitherto classed *as pasture* must have been diverted to rough grazing and forestry, the latter area having increased by 178,000 hectares over the 20 year period. Of course "other" land, which includes land under

Table 1: *Land Use in Ireland in Certain Years*

	1970	*1975*	*1980*	*1985*	*1990*
			'000 ha		
Corn Crops	381.4	342.4	446.5	402.3	329.9
Other Tillage	150.7	117.2	107.2	95.6	86.0
Total Tillage	532.1	459.6	553.9	497.9	415.9
Hay/Silage	918.6	1,065.2	1,212.8	1,247.4	1,287.7
Pasture	3,344.1	3,165.3	2,929.0	2,957.4	2,978.9
Crops and Pasture	4,794.7	4,690.0	4,695.7	4,702.7	4,682.5
Rough Grazing	n.a.	1,026.0	1,008.7	1,002.4	966.1
Plantations[1]	235.0[2] (211.6)	298.2 (260.3)	318.2 (294.8)	362.0[2] (325.7)	413.0[2] (371.6)
Other Land	1,094.7	1,173.4	1,184.8	1,184.1	1,240.6
Total Area	6,889.4	6,889.4	6,889.2	6,889.2	6,889.2

Notes: [1] Also included in "other land".
[2] Estimated.
Figures in parentheses under Plantations are State/Coillte owned Forest properties.
Source: Central Statistics Office, Dublin.

marshes, bogs, roads and buildings, could also have received land from other uses including all of the previously mentioned categories; the other land increased in area by over 100,000 hectares over this period. It is thus not possible to say precisely from what categories of land the increase in forestry area came. It would appear that although a significant portion must have come from land classed as grassland, the bulk of it was probably classed as rough grazing. Little new planting would have taken place on former tillage land.

The figures for plantations in Table 1 must be taken with caution, as in only two years of the five shown have official estimates of the *total* area of woods and plantations been prepared (1975 and 1980). In those years State owned forestry represented 87 per cent and 92 per cent respectively of the total area under trees in the country. The estimated area of forest in Ireland is now (1992) about 450,000 hectares or 6.5 per cent of the land area of the state. The proportion for each Member State in 1989 is shown in Table 2, the figure given for Ireland, taken from EC sources, is somewhat lower than our own national estimate.

Table 2: *Woods and Forests in EC, 1990*

	Area	*Percentage of Land Area*
	'000 ha	*Per cent*
Belgium	617	20.4
Denmark	493	11.6
West Germany	7,360	30.3
Greece	5,755	44.7
Spain	12,511	25.1
France	14,688	27.3
Ireland	415[1]	6.0
Italy	6,410	21.9
Luxembourg	88	34.5
The Netherlands	330	8.7
Portugal	2,986	32.4
United Kingdom	2,297	9.5
Total	53,950	24.3

Note: [1] Irish figure estimated at 450,000 hectares at end of 1992.
Source: Agricultural Situation in the Community, 1992 Report. EC, Brussels

Table 2 shows that the proportion under forest in the different countries in 1990 varied from 6.0 per cent in Ireland to about 45 per cent in Greece, with a Community average of 24.3 per cent. About 85 per cent of the forest area in Ireland is in public ownership compared with an EC average of 42 per cent. But given the new emphasis on private afforestation, the balance is now shifting significantly in Ireland where about 85 per cent of private woodland is owned by farmers. The remaining forest is owned by private investors and forest or financial companies.

About 90 per cent of the productive Irish forest area is under conifers with Sitka and Norway Spruce accounting for almost two-thirds, and Lodgepole Pine for almost one-quarter of the coniferous plantations.

As indicated earlier the Irish planting target for 1993 is 30,000 hectares made up as shown in Table 3.

Table 3: *Irish Planting Target for 1993*

	Coillte	*Private*	*Total*
Forestry Operational Programme:		*Hectares*	
Afforestation	8,100	14,200	22,300
Improvement	1,000	-	1,000
Reconstitution	600	300	900
Rural Development (ORPD)	1,300	300	1,600
Reforestation	4,200	-	4,200
Total	15,200	14,800	30,000

The Operational Programme for Rural Development (OPRD) covers support for amenity projects capable of creating tourist attractions. It includes support for projects such as broadleaved forest parks, with walks and nature trails, and planned recreational forests with associated development of activities such as fishing and game shooting.

Chapter 3

THE IMPLICATIONS OF CAP REFORM FOR GROWTH IN FORESTRY AREA

The recent CAP reform will have major implications for the future of forestry in Ireland as indicated in Appendix B. We can summarise these features by saying that the progressive expansion in grazing livestock numbers which we have witnessed in recent years will be effectively curtailed with the reform of the CAP. The agreement ordains that revenue received by farmers will henceforth be comprised of a lower proportion from the market and a higher proportion of direct supports (headage payments). The compensatory mechanism gives a slightly more progressive orientation to agricultural support in a distributional sense but whether these payments will fully compensate producers for lower prices is one of a number of factors which will ultimately determine the competitiveness of forestry with conventional agriculture for land resources.

The dominant farming systems on the medium to poorer quality soils are cattle and sheep. Among the cattle systems the most numerous group is farms with beef cows mainly in the single suckling system. As a result of the CAP reform the gross margin from single suckling will be significantly increased. The effect on the sheep sector is more difficult to anticipate. It will however effectively curtail any further expansion in sheep numbers and could even cause a slight reduction on the 1992 level. Producers' incomes are likely to decline also or at least not advance on their rather depressed 1992 level. The same is true for dry cattle rearing systems. They will fare less well than the specialised single suckling system.

The expected improvement in single suckling farmers' incomes could cause an unwillingness among such farmers to release land for forestry. On the other hand the curtailment in sheep expansion, the possible longer-term decline in income from some cattle systems, and the much improved incentives for forestry make it likely that the expansion in private forestry in recent years will continue, though probably at a reduced rate.

As a result of the introduction of the Western Package, which gave increased planting grants, private afforestation rose from 275 ha in 1981 to 498 ha in 1982 and to 3,215 ha in 1987 when cattle headage supports were introduced to compensate for loss of income from farming on afforested land. The introduction of the Forestry Operational Programme in 1989, under which planting grants were further increased and area premia made available, gave an added impetus to private forestry and by 1991 private first time plantings reached 11,298 ha. Over 70 per cent of these plantings were carried out by farmers on their own land.

As far as can be ascertained the increased planting has had little effect on income from farming except where whole farms were planted. Most of the land planted was producing very little in the way of agricultural output. There are still thousands of hectares of wet mineral soils all over the country which are producing very little agricultural output and which would yield very good forest crops.

The Impact of the Extensification Measure

The CAP reform for the beef sector includes an extensification measure whereby producers who stock their farms at less than 1.4 livestock units per hectare of forage (mainly grassland) are paid premia on their suckler cows and male cattle over the age of 6 months. This premium is paid at the rate of 30 ECU for each qualifying animal (equivalent to about £28.7 after the recent Green Punt devaluation), and contributes significantly to the enhancement of margins under the reform of the CAP. In the example shown in Appendix B, almost one-third of the increase in gross margin is due to the extensification premium and, as indicated also in Chapter 9, the areas of the country with very low stocking rates are very substantial. Indeed, the method by which the stocking rates are calculated considerably extends the area of the country which will benefit from the extensification premia. For instance, about 46 per cent of the country would have a stocking rate of less than 1.4 livestock units per hectare of grassland (including rough-grazing) when *all grazing livestock units* are included in the calculation. However, this rises to 71 per cent when the calculation is made on the basis of the method used for implementing CAP reform. The latter method excludes all female livestock other than cows, male animals under the age of 6 months, all sheep other than ewes and all other categories of grazing livestock.

There are two sets of circumstances which arise relating to the operation of the extensification premium and its implications for forestry. First, the measure in itself enhances the returns from the most prevalent system of cattle production in marginal areas by approximately £20 per hectare and this makes agriculture more competitive with forestry than previously. In another set of circumstances where stocking is above the threshold of 1.4 livestock units per hectare there will be pressure to enlarge the forage area by renting or purchasing extra land so as to achieve the qualifying stocking intensity for the payment of the extensification premia. These practices will, therefore, aid the retention of land in agriculture which might otherwise be planted under the farm forestry scheme or sold to others for afforestation. It is also likely to impart an upward pressure to land prices in the areas concerned. To counteract this effect it may be necessary to increase the forest premia under the next Forestry Operational Programme.

Chapter 4

CHARACTERISTICS OF AREAS STUDIED[1]

In order to select worthwhile areas for the field study visits were made to South Wicklow, Slieve Bloom, East Mayo/West Roscommon and East Sligo districts. Arising from these visits and after examining the physical, social and economic features of the four areas, two were selected for the study, viz., an area around Aughrim in Co. Wicklow and an area in East Mayo/West Roscommon. These areas will be referred to interchangeably as Wicklow or East and Mayo or West. The land areas in both regions are almost the same size (c. 15,000 ha). The District Electoral Divisions (DEDs) included in the respective areas are:

East (Wicklow)	*West (Mayo/Roscommon)*
Aughrim	Kilbeagh
Ballinacor	Kilmovee
Ballinglen	Urlaur
Coolballintaggart	
Killballyowen	Artagh *North* (Roscommon)

The areas, population, and distribution of people at work in each of these districts in 1986 were as shown in Table 4.

Table 4: *Areas, Population and Distribution of People at Work in the Selected Study Areas*

		East	*West*
Land Area (ha)		15,482	14,993
Population		2,149	3,074
Total at work:	No.	560	904
	%	26	29
Per cent in:			
Agriculture (incl. forestry)		44	47
Industry		28	26
Services		28	27

As indicated in this table the areas selected are predominantly rural in character given their location and the distribution of the labour force at work by sector. The proportions in both areas in industry and services were also fairly similar. The national distribution of people at work in 1986 for reference was (per cent): agriculture 15.5, industry 28.4, services 56.1.

[1] Based on Central Statistics Office data.

It should be noted that the figures for agriculture include forestry and fishing at the primary level.

There is one very interesting contrast between the two selected areas in respect of population trends. It is outlined in the following set of data, showing the population levels for certain years:

	1926	*1951*	*1961*	*1971*	*1986*
East	2,176	1,883	1,733	1,803	2,149
West	7,997	5,193	4,064	3,311	3,074

Whereas the population in both areas was in decline up to 1961 the trend reversed thereafter in the Wicklow region and was back almost to its 1926 level by 1986. By contrast the population decline was considerably more severe in the Mayo/Roscommon area and the decline has persisted. In consequence the population in the latter area had fallen by 62 per cent from 1926 to 1986. While a number of hypotheses could be adduced to explain the difference in population trends in both areas, including proximity to centres of employment, quality of agricultural resources, farm size and participation in tourism, it seems probable that forestry did play a major role in stabilising the population in the Wicklow area. The field survey should help to establish the significance of forestry in this regard.

Soil Characteristics

In the Wicklow area, the main physiographic division is hill and the principal *soil association* is brown podzolic. The forest yield class[2] is approximately 16-18 on these soils. In the Western area there is a greater diversity in soil divisions. The principal topography is flat to rolling lowlands and the soil associations are mainly comprised of gleys and basin peats. The forest yield class is in the 18-20 region.

Distribution of Holdings

Though the total surface areas of the two regions chosen is similar, the distribution of holdings by size and, in consequence, the average size of holdings are very different. The Wicklow area is hill country with a considerable amount of extensive grazing by cattle and sheep in particular. Almost 60 per cent of the holdings were over 20 hectares in 1980 and 22 per cent were over 40 hectares. The average size of holding was 59 hectares. By contrast the holdings in the Western area were typical of those in the Connacht Province being predominantly in the smaller size categories with almost 90 per cent less than 20 hectares and an overall average size of 13 hectares.

[2] Yield class is defined as the potential production in cubic metres per hectare per annum from a given area of land.

Table 5: *Distribution and Average Size of Holdings in Study Areas, 1980*[1]

Size (hectares)	*East*	*West*
	Per cent	
0.5-6	13	24
6-12	11	41
12-20	18	23
20-40	36	11
40+	22	1
Total	100	100
Average Size of Holding (ha)	59	13

Source: Central Statistics Office, Dublin.
Note: [1] Latest year for which small area agricultural Statistics available.

Land Use

Although no small area statistics are available since 1980, the data for that particular year give some indication of the broad categories of land utilisation in the respective areas. The proportions in the particular categories are shown in Table 6.

Table 6: *Land Utilisation in Study Areas in 1980*

	East		*West*	
	Per cent			
Tillage	10	(11)	1	(1)
Hay/pasture	34	(37)	70	(82)
Woods/forests	21	(23)	2	(2)
Rough grazing	27	(29)	13	(15)
Remainder	8		14	
Total	100	(100)	100	(100)

Source: Central Statistics Office, Dublin.

In the East region forested areas occupied 21 per cent of the land area and 23 per cent when the "remainder" of the land area was excluded (i.e., areas under bog, marsh, water, roads, buildings, towns etc.). In the West the corresponding percentage was 2 per cent. Tillage farming was almost non-existent in the West in 1980 but Wicklow had considerable areas under crop production. Given the hilly nature of the area, quite a high proportion of the land area is devoted to rough grazing in Wicklow, being about twice the proportion used for this purpose in the West. Dairy farming is of relatively minor importance in both areas. The predominant farming system in the Western area is cattle production with relatively few

sheep; by contrast sheep farming seems to be of equal importance to cattle production in the Wicklow area.

The 1991 Census of Agriculture small area data will not be available until well into 1993, so a field survey had to be used to determine current land use, the farm labour force and farming systems as well as the level of farm income and its contribution to household income.

Chapter 5

SURVEY OF STUDY AREAS AND ANALYSES OF SURVEY DATA

A sample of 570 names was drawn from the Register of Electors for the two areas described. These names were used in the survey to identify households and their characteristics (a copy of the questionnaire used is available in the ESRI). The household survey did not identify non-residents working in the study areas. These were identified from visits by the authors to the main businesses in the areas. The number of completed household questionnaires was 465. Of these, 217 were in Wicklow and 248 in Mayo. The population distribution by area and by age category of the sample households is shown in Table 7.

Table 7: *Population by Age Category in the Sample Households and Average Household Size in Study Areas 1992*

Age	*East*		*West*	
	No.	*Per cent*	*No.*	*Per cent*
<15	227	27.8	240	28.1
15-29	170	20.8	158	18.5
30-49	197	24.1	168	19.6
50-64	123	15.1	161	18.8
65+	99	12.1	128	15.0
Total	816	100.0	855	100.0
Average Household Size	3.76	-	3.44	-

The average size of household was somewhat greater in Wicklow than in Mayo, reflecting a higher proportion of single and widowed heads of household in the latter area. The Mayo area had also a somewhat higher proportion of its population in the over 65 age bracket and a high proportion of one person households. The proportions under 15 years of age were about the same in the two areas.

Economic Status of Working Population

The principal economic status of the population aged 15 and over is shown in Table 8 together with a national comparison from the 1991 Labour Force Survey.

The Wicklow area had a somewhat higher proportion of the population aged 15 years and over in the labour force than the Western area but it also had a higher proportion of its *labour force* unemployed. By contrast the Western area had a higher proportion of retired persons and students among its population.

Table 8: *Economic Status of Population 15 years and over† Resident in the Study Areas in 1992 and in the State in 1992*

Economic Status	*East*	*West*	*National*[1]
		Per cent	
At work	43.0	41.5	42.9
Unemployed	10.5	7.7	8.6
Home duties	31.0	29.8	24.8
Retired	6.3	9.8	8.3
Student	7.8	9.8	12.3
All other	1.3	1.4	3.1
Total	100.0	100.0	100.0
No.	1,634	2,373	2,621,000

Source: [1] Labour Force Survey, 1992.
Note: † Figures do not include non-residents working in the East and West areas.

The age distribution of all persons at work shows a marked difference between the two areas as indicated in Table 9.

Table 9: *Age Distribution of Resident Persons at Work*[1]

Age	*East*	*West*
	Per cent	
15-29	31.7	24.2
30-49	41.7	34.1
50-64	18.7	29.4
65+	7.9	12.3
Total	100.0	100.0

Note: [1] Does not include non-residents working in area.

Both the older age groups were relatively much larger in the West, almost certainly reflecting the higher proportion of farmers in the area.

Of the heads of household in both areas, 87.1 per cent were male with a slightly higher per cent of males in the Wicklow region. The percentage distribution of heads of household by age was similar for the oldest and youngest categories for both areas. However, the Western area had a significantly higher proportion in the 50-64 age bracket and a correspondingly lower proportion in the 30-49 bracket than the Wicklow region.

The major difference between the areas with respect to *economic status* of heads of households related to the proportions classed as unemployed and at work. A significantly higher proportion of the heads of household were unemployed in Wicklow and a correspondingly lower proportion at work in Wicklow than in Mayo, reflecting the larger proportion of self-employed farmers in the latter area. Not surprisingly 97 per cent of heads of household at work were male. The more farming character of the Western area also

probably explains the higher proportions of heads of households at work in the older age groups in that area as is indicated later.

Occupations of Those at Work

The distribution of occupations by sector or industry is shown in Table 10. The dominant share of employment in Mayo is in agriculture with over 51 per cent in this category. Building and Construction and Public Administration come next on the list in this area, with a little over 12 per cent in each category. Manufacturing comes next with about 10 per cent. Only about 1 per cent of people at work in the West are in forestry.

In Wicklow by contrast only about 29 per cent of those at work are in agriculture whereas almost 22 per cent are employed in the forestry sector which includes timber processing. Public Administration and Commerce/Insurance were also of importance in this area with about 12 per cent of the workers being employed in each sector.

Table 10: *Distribution of Employed Residents in Study Areas by Sector*[1]

Sector	*East*	*West*
	Per cent	
Agriculture	29.2	51.2
Forestry[2]	21.7	1.2
Manufacturing	7.1	10.2
Building/Construction	5.4	12.1
Commerce/Insurance	11.7	8.2
Transport/Communications	6.3	1.2
Professions/Services	2.1	1.6
Public Administration	12.9	12.1
Other	3.8	2.3
Total	100.0	100.0

Notes: [1] Does not include non-residents working in areas but includes residents working outside the area.
[2] Includes timber processing.

Employment in the forestry sector was subdivided into 4 categories, viz, production/maintenance, transport/haulage, processing, and nurseries largely associated with the production of forest plants. In the Wicklow area there was an equal divide as between the numbers working in the forests and in processing, with significant numbers also working in nurseries.

The location of each job or activity was established in each area. Virtually all occupations in agriculture were located in the study areas, not surprisingly in view of the fact that most were farmers or relatives assisting. About 80 per cent of forestry occupations arising in the sample were located within the areas but most of the jobs held in manufacturing were held outside the areas. Almost half the jobs in public administration were held outside

the study areas also. It would appear therefore that forestry jobs tend to be taken up by the local labour force to a greater extent than for most other occupations except agriculture.

Incomes Arising in the Study Areas

In presenting the survey results two income concepts were adopted. For the purpose of showing income distribution classified in various ways in the two areas we took the incomes of all households in the sample regardless of where the household residents worked. Household income for this purpose was defined, as in the CSO Household Budget survey, to include all money receipts, including state transfers, of a recurring nature which accrued to the households at annual or more frequent intervals, together with the value of any free goods and services received by household members, plus the retail value of own farm or garden produce consumed by households.

For the purpose of comparing actual incomes arising in the two areas we deducted from the household income as defined above the incomes of residents working outside the study areas and added on the incomes of non-residents working in the areas together with an estimate of business profits generated in the area but accruing to non-residents. The Survey identified whether residents were working inside or outside the study area. To identify non-residents working in the areas interviews were carried out by the authors with the main employers to determine the numbers of such workers employed and their appropriate incomes from such employment. When the incomes were adjusted for residence of workers they were grossed up to give total regional incomes as explained in a later section.

The Calculation of Farm Income

In conducting the survey the income of every resident in the sample households was determined together with the source of that income (i.e., from agriculture, forestry, industry, etc.). Non-farm workers were able to give their annual incomes either from memory or in the case of business people from business accounts. The calculation of farm incomes proved much more troublesome as relatively few households had comprehensive records of income from farming.

The farm incomes were estimated by assigning gross margin coefficients to the livestock and crop activities reported from the farm holdings in the study. The coefficients were adopted from Teagasc planning guidelines (Teagasc, 1992a) for each crop and livestock activity on the sample farms with appropriate adjustments for fixed costs. Two basic methods of calculation were used. One was area-related with gross margins assigned to the areas devoted to each livestock and crop enterprise. The second method was similar to the first except for the livestock activities where the gross margins were based on a per head of livestock or livestock unit basis as appropriate. The first method yielded income estimates close to what would be expected from the areas and systems of farming in question and the estimates also correspond more closely to the Teagasc National Farm Survey (NFS) estimates for 1991 for areas corresponding to those in the study. Therefore, the results of this method were adopted.

Average farm incomes classified by farm size in the two study areas are given in Table 11 which shows that average farm income in the Wicklow area was £8,723 in 1991 compared with £3,182 in the Mayo/Roscommon area. In the Eastern area average farm incomes varied from £1,901 per annum on the 0-6 ha group to £17,803 on the over 40 ha group. The corresponding figures in the Western area were £471 and £5,642 respectively.

It should be stressed that these are the incomes from the farming sector only. Most of the farm households had incomes from other sources as well.

Table 11: *Average Farm Income by Farm Size in Study Areas, 1991*

Size Group (ha)	*East*	*West*
	£	
0-6	1,901	471
6-12	1,437	1,567
12-20	4,304	2,870
20-40	7,223	5,337
40+	17,803	5,642
All Sizes	8,723	3,182

When the farm incomes were calculated they were included with the incomes from other sources in the relevant households to derive total household income for both farm and non-farm households in the study areas. The non-farm income sources were classified as follows:

- earned income - employees and self employed,
- other income - investment income and income from property and
- State transfers - Child benefits, unemployment payments, pensions, etc.

Distribution of Household Income

The distribution of total household income for all residents in each area is shown in Table 12 as well as the area averages.

As expected, the income distribution is highly skewed towards the lower income groups and somewhat more so in the Western area. About 50 per cent of households in the East and 59 per cent in the West had incomes of less than £10,000. The average household income in the Wicklow area of £14,017 is over 30 per cent higher than in the Western area and these levels would appear to be consistent with the estimated income from the 1987 Household Budget Survey adjusted to 1991 levels. The households in both areas would be classed as *rural households* although the Wicklow area contains a proportion of households

Table 12: *Distribution of Household Income*

£/annum	*East*	*West*
	Per cent	
0 - 4,999	9.7	21.4
5,000 - 7,499	23.0	23.0
7,500 - 9,999	17.1	14.9
10,000 - 14,999	17.1	19.4
15,000 - 19,999	15.7	11.3
20,000 - 24,999	5.1	4.4
25,000 - 29,999	3.2	2.4
30,000 - 39,999	5.5	1.6
40,000+	3.7	1.6
Total	100.0	100.0
Average per household (£)	14,017	10,711

where the main source of income would be derived from employment or business located in urban areas. The contribution of income by source to total household income was computed also for each area. The sources of income for each area are shown in Table 13.

Table 13: *Source of Household Income*

	East	*West*
	Per cent	
Agriculture	15.0	19.9
Forestry	13.1	0.7
Other earned income	28.7	29.3
Non-State payments	2.9	4.4
State transfers	33.2	44.0
Other	7.1	1.7
Total	100.0	100.0

The rather large contributions from agriculture in both areas are noted, especially in the West, but the proportion of household income derived from State transfers seems exceptionally high in both areas and particularly in the West. The demographic and social situation in the latter area - in addition to the high level of unemployment, go some way toward explaining the high proportion of income derived from State payments. Old Age Pensions and the smallholders' assistance contributed substantially to the State transfers in the West. The contribution of forestry is very significant in Wicklow accounting for just over 13 per cent of total income while it is relatively insignificant in the Mayo/Roscommon area. Indeed in the former area we are possibly now close to a situation where agriculture and

forestry are of equal importance in household income formation. The significance of forestry in the Wicklow area in income formation is underlined when expressed in terms of its contribution to *direct* income (i.e., gross income less state transfers). Expressed in this manner the contribution of forestry to total household income rises to almost 20 per cent.

The dependence on forestry as a source of household income varies greatly between households.

Table 14: *Distribution of Households by Degree of Contribution of Forestry to Income*

Contribution (%) to income	*East*	*West*
	% of households	
<10	80.0	98.8
10 - 19.9	0.5	-
20 - 29.9	1.4	-
30 - 49.9	5.6	0.8
50 - 74.9	2.8	-
75 - 100	9.8	0.4
Total	100.0	100.0

The distribution of households by degree of contribution of forestry to income is shown in Table 14. As indicated in this table the contribution of forestry to income in the West is negligible. Only 1.2 per cent of households in the area have any significant income from this source. In Wicklow on the other hand the position is quite different. Some 18.2 per cent of households derive 30 per cent and more of their income from forestry while 13 per cent obtain 50 per cent or more of their household income from this sector. As between farm and non-farm households, a larger proportion of the latter derive a higher contribution of their household income from forestry than households with farms. This indicates that forestry is instrumental in maintaining incomes and employment and contributing to balanced rural development.

The Calculation of Area Income

The calculation of total income for each area was estimated in the following manner. The number of households was derived by dividing the total number of persons per household in the survey (i.e., those aged 18 years and over) in each study area. The average income per household was multiplied by the total number of households in each area to give total area income on the basis of the *total household income of all residents.*

To derive the income arising, in the sense of total income generated in the respective areas irrespective of the place of residence of the recipients of those incomes, adjustments were made to the incomes derived by the household income method.

First, the incomes of residents working outside the area were deducted. Second, the incomes earned in the area by non-residents and from other sources were added to the incomes of residents employed within the study area to give total income as defined. The distribution of these income estimates is given in Table 15.

Table 15: *Distribution of Total Income Arising in Study Areas*[1]

	East	*West*	*East*	*West*
	£'000		*Per cent*	
Agriculture	1,266	2,040	11.7	21.8
Forestry[2]	4,250	72	39.1	0.8
Industry/Services	1,695	2,102	15.6	22.5
State Transfers	2,801	4,510	25.8	48.2
Other	844	625	7.8	6.7
Total	10,856	9,349	100	100
Average income per person 15 years and over	6,722	4,187	-	-

Notes: [1] Includes incomes of non-residents employed in the study areas and excludes incomes of residents working outside the areas.
[2] Includes incomes of saw-mill workers in study areas.

Using this income concept we note that the contribution of forestry to total income in Wicklow is much higher than that shown in Table 13, 39.1 per cent as against 13.1 per cent. This occurs because a large number of the forestry workers live outside the study area and were omitted in preparing Table 13. These results show the significance of forestry in the generation of income in the area and its likely contribution to the maintenance of population as indicated in Chapter 4.

The income coming from State transfers in the West increases also in Table 15, mainly because more residents are employed outside the area than non-residents are within the area.

Table 15 also shows, that according to the definition adopted, total income arising in the East is about £1.5 million greater than that in the West. Also, because the population in the East is less than that in the West the average income per person 15 years of age and over is correspondingly greater in the former than in the latter area, £6,722 versus £4,187.

Chapter 6

LAND USES IN THE STUDY AREAS

Agriculture

The number of farms in the sample was 58 in Wicklow and 153 in Mayo. The distribution of farms by size in both areas is shown in Table 16. As expected the farms tend to be larger in Wicklow than in Mayo whether the measurement of size is all land or "crops and pasture".

Table 16: *Distribution of Farms by Size in Study Areas*

Size (ha)	*East*	*West*
	Per cent	
0-6	3.4	7.8
6-12	8.6	28.1
12-20	19.0	29.4
20-40	43.1	31.4
40+	25.9	3.3
Total	100.0	100.0

Those landholders who declared themselves as primarily working on their farms represented 74 per cent of the holders in Wicklow and 67 per cent in Mayo. The large proportion engaged in part-time farming in Mayo is not surprising in view of the smaller sized farms there.

As would be expected grass production was the overwhelming use of land in both areas, with forestry occurring on only 6 farms in Wicklow and on 15 farms in Mayo. The actual proportion of land on farm holdings under forestry was 0.7 per cent in Wicklow and 4.4 per cent in Mayo. There was no wheat or barley growing reported in the Mayo sample with a little oats on a few farms. The incidence of other crops, including potatoes, was insignificant. The growing of barley was fairly prevalent in Wicklow, this crop being grown on 14 per cent of the farms in that area. The incidence of other crops was insignificant also.

Incidence of Livestock

All holdings in Wicklow and all but 8 holdings in Mayo had cattle of one category or another. With respect to sheep, only 2 farms in Wicklow had none; in Mayo by contrast only 10 per cent of the farms had sheep. Pigs were practically non-existent, being reported on only 3 holdings in both areas. The incidence of poultry was considerably greater, being

reported on almost 18 per cent of holdings, and providing produce largely for domestic consumption.

Physiographic differences between the areas is reflected in the rate of participation in milk production. This varied from 12 per cent in Wicklow to 24 per cent in Mayo, the difference being mainly due to the upland nature of farming in Wicklow with its emphasis on sheep farming.

The Forestry Sector in the Study Areas

The two areas differed appreciably in regard to the employment and income effects of forestry, largely because of the extent and degree of maturity of the forests in the respective areas. In the *Western* area the proportion of land planted to forest is now estimated at *about* 660 hectares. The estimated distribution by date of planting is as follows:

	Pre-1950	*1950-59*	*1960-69*	*1970-79* \ / *1980+*
Per cent	-	5	15	80

Virtually none of the forest is in the 40 years or more age category. Given the age distribution, the quantity of product sold is relatively small and is estimated at 6,500m^3 for 1992. About two-thirds of this total is sold to Murray Timber in Ballygar and the balance to TDS in Connemara both of which are outside the area. The harvesting estimate from within the area is put at 5,000m^3 per annum over the next 3 to 4 years. The current planting programme by Coillte in the area is at a rate of 60 hectares per annum compared with a rate of 20 hectares 5 years ago. The Coillte-owned areas were acquired in relatively small lots, generally of an average size of 5 hectares, and individually representing separate farm holdings. The present rate of planting by all interests, including private forestry, would leave about 12 per cent of the land in the area planted by the end of the decade which represents a significant shift in land use. This rate of increase is more than double the national average afforestation target set in the Forestry Operational Programme.

In regard to employment 3 people are employed *full-time* by Coillte in the area while a further 7 are occupied full-time on a contractual basis with Murray Timber and TDS for harvesting and transport.

Wicklow Area

About 22 per cent of the *Wicklow* area is forested and the distribution by date of planting is as follows:

	Pre-1930	*1930-39*	*1940-49*	*1950-59*	*1960-69*	*1970-79*	*80+*
Per cent	9.7	7.8	10.1	19.8	19.4	20.9	12.3

One-fifth of the total forest area has been planted in each of the decades of the 1950s, 1960s and 1970s with about 12 per cent planted since 1980. Thus, in contrast to the West region the Wicklow area would be considered a mature forestry area with a continuous supply of timber coming on stream for processing into pulpwood, palletwood and sawwood. It is this essential difference which determines the nature and extent of the social and economic impact of forestry in the respective areas.

In the five DEDs in the Wicklow area an estimated 3,300 hectares are forested representing about 22 per cent of the land area. Of this area 500 hectares are privately owned, and are not considered to be of economic importance at the present time, leaving 2,780 hectares contributing to the forest rotation in the area. The estimated output in 1992 was about 30,000m^3 of which 17,000m^3 was sold to Woodfab Ltd and processed within the catchment area while the balance was sold to a number of other outlets. Because of the economic depression, less timber than normal was produced in 1992. In a normal year sales would be about 45,000m^3. The current planting programme in the area is at a rate of 100 hectares per annum which would leave about 27 per cent of the land area planted in a decade from now. The main sources of employment in or related to forestry within the area are categorised below.

I *Processing*

- The major processor in the area is *Woodfab Ltd* which employs 147 in its Aughrim operation, mainly sawmilling; the company also has operations in Arklow, Mountrath, and Fermoy; Coillte supplies virtually all its materials most of which come from outside the area; a further 120 people are employed in harvesting and haulage on a contractual basis.
- There is one small family owned sawmilling operation in the area which processes an insignificant quantity of timber.
- *Avondale Timber Limited* in Rathdrum is also a significant wood processor, just outside the study area; employment is 25.
- There are also a number of small sawmills operating either on the perimeter or being supplied partly from the study area; these are in Arklow, Gorey, Donard, Tinahely and Tullow; the products include sawdust for stud and other farms, sleepers, fencing posts/railing and furniture.
- There is also a bark mulch operation in Rathdrum which uses residues from Woodfab and Avondale Timber.

II *Contracting/Haulage*

- The largest single contractor/haulier in the area, whose business provides services to Coillte, Avondale Timber and others, is the firm *Mountain Lumber* which has 6 full-time employees and 25 on a sub-contracting arrangement in harvesting.
- Another haulier in the area, is largely operating from Carnew and employs 5 people on a full-time basis.

- There is another haulier in the same townland as Mountain Lumber largely on forestry work transporting materials mainly for Woodfab and operating between all Woodfab operations and transporting also for export.
- Another haulier associated with forestry, transports material for planting operations, e.g., gravel.

III *Nurseries*

There are 5 nurseries in the study area including Coillte but 3 are relatively minor and give employment to 3 people on a full-time basis and a further 4 on a part-time (25 per cent) basis.

The two large nurseries are:-

- *Aughrim Nursery (Coillte)* produces forest plants and directly employs 9 people (2 administration/management, 7 general operatives) and has a subcontractual arrangement for the balance of its operations which covers 15 workers for 9 months of the year; the nursery produces 7.6m plants per annum.
- *Cappagh* and *Woodside* Nurseries produce forestry and fruit plants and ornamental shrubs; there are 3 people in management/self-employment, 7 whole-time employees and 4 part-time employees.

Other Activities (Site Preparation/Planting/Establishment):

About 10 people are employed in the area for these operations.

The total number of people employed within the area on a whole-time basis on all forestry operations was 353. These deal with timber from within and outside the study area. We reckon on the basis of discussions with Coillte and the various processors and hauliers, that about 130 people are needed on a whole-time basis to deal with all the forestry operations taking place in the study area, i.e., planting, brashing, thinning, harvesting, hauling and processing. Considering that there are about 2,980 hectares of forest in the area the labour requirement is thus one labour unit per 23 hectares of forest.

Chapter 7

ATTITUDES TO FORESTRY[3]

All persons in the sample households over the age of 15 were asked their opinions on the development of forestry with a choice of response varying from "strongly in favour" to "strongly against". A total of 815 responses were elicited which represents almost 70 per cent of the selected sample. Table 17 sets out the opinions received to this question by area.

Table 17: *Opinions on Development of Forestry in Study Area*

Opinion	*East*	*West*
	Per cent	
Strongly in favour	53.0	5.8
In favour	34.0	47.5
Indifferent	7.3	16.0
Against	4.4	21.7
Strongly against	1.3	9.0
Total	100.0	100.0

There are large differences in attitudes between the two areas. In Wicklow 53 per cent of respondents expressed themselves as "strongly in favour" of forestry development compared with less than 6 per cent in Mayo while a further 34 per cent in Wicklow and 47.5 per cent in Mayo were "in favour". When these two categories are combined 87 per cent of Wicklow respondents and 53.3 per cent of those in Mayo were in favour of forestry. The proportion of people showing indifference to the issue was over twice as great in Mayo as in Wicklow and represented about one-sixth of all responses in the former. This probably reflects the lower density and early stage of development of forestry in the Western study area.

A negative attitude to forestry was expressed by 5.7 per cent of respondents in Wicklow but this response rate increased to almost 31 per cent in Mayo with about one-quarter in this category expressing a strong opposition to forestry development. The differences in attitude are a matter of concern and interest. There has always been a high degree of antipathy towards forestry by the Irish farming community and it seems that the attitude continues to persist, particularly in areas where forestry is undeveloped, and its advantage in terms of income and employment are not appreciated. On the other hand in areas with a relatively high level of forestry the above advantages are apparent and there is a positive attitude to forestry development.

The responses were analysed to test possible differences in opinions to forestry as between persons working in agriculture and with other occupations. In Wicklow a slightly

[3] For a further treatment of this issue, readers are referred to an accompanying study (Hannan and Commins, 1993).

higher proportion of people with other occupations was in favour of forestry and a slightly lower proportion against than those with agricultural occupations. In the Western region similar differences were apparent in the responses of persons with non-agricultural occupations but the opinions against forestry were much more strongly felt by those in the agricultural sector than in other occupations.

Opinions were also categorised by the reasons given for expressing such opinions. The overwhelming reason given in Wicklow by those *in favour of forestry* was that it gave employment (c. 75 per cent) followed by its positive contribution to the environment (10 per cent). By contrast the dominant reason (70 per cent) given by this category of respondents in Mayo was that forestry provided a good way of using marginal land with a significant proportion (13 per cent) stating that forestry development gives employment in the area.

As there were relatively few responses against forestry in Wicklow a subdivision of the reasons for holding them is not meaningful. The dominant reason by those opposed to forestry in Mayo was that it was inimical to agriculture (c. 60 per cent), while other reasons most frequently mentioned were that it caused depopulation and isolation or gave little employment.

The main categories of responses are outlined in Table 18 for those generally favourable to forestry.

Table 18: *Reasons for Positive Attitude to Forestry*

Responses	*East*	*West*	*Total*
		Per cent	
Gives employment	69.2	8.8	38.6
Positive land use	6.2	48.5	27.6
Supplements agriculture	3.1	21.5	12.4
Enhances amenity/scenery	4.8	2.5	3.6
Enhances environment	3.9	1.2	2.4
Other	12.8	17.5	15.4
Total	100.0	100.0	100.0

A great diversity of responses was given to this question but in each area one particular category stood out. In Wicklow nearly 70 per cent had a positive attitude to forestry because of its perceived significance in the local economy with regard to employment. Respondents or members of their families were either directly involved in the forestry sector themselves or more importantly they were aware of the scale of economic activity and employment in the area either directly or indirectly associated with forestry. In Mayo the most frequent response given related to the use of forestry for exploiting marginal land. This accounted for nearly half the responses associated with a positive attitude to forestry. Another important category of response (21.5 per cent), which can be treated as either closely related to the previous reaction or separate in its own light, viewed forestry as supplementary to agriculture in terms of giving some employment, stabilising the local population and

enhancing farm earnings. The role of forestry in enhancing the environment and the landscape and amenity features of the area were very much secondary to the main responses referred to earlier but collectively they were perceived as over twice as important in Wicklow (8.7 per cent) as in Mayo (3.7 per cent). The major reasons for the negative attitudes towards forestry, particularly in Mayo, were that it causes isolation and de-population. There were also some concerns expressed about the risks of fire, that forestry encouraged vermin and increased land prices. These reasons were given little or no emphasis in Wicklow.

About 95 per cent of respondents in Wicklow who gave an opinion on forestry development stated that their dwelling or farm was located close to an area of forest; the corresponding proportion was 63 per cent in the West. The responses on their feelings on this matter are outlined in Table 19. The responses to this question are closely related to those on the opinion on forestry development with a strongly positive attitude in Wicklow but a significant minority in Mayo expressing dissatisfaction with living or farming in close proximity to forests.

Table 19: *Attitudes to Living Near Forest*

Responses	*East*	*West*	*Total*
		Per cent	
Like a lot	54.1	2.5	31.8
Like	33.7	48.4	40.0
Indifferent	9.8	21.9	15.0
Dislike	2.4	17.2	8.8
Dislike a lot	0.0	10.0	4.3
Total	100.0	100.0	100.0

Attitudes to forestry were cross-tabulated with the proximity of the respondent to a forest. In Wicklow a higher proportion of those living near a forest were in favour of forestry than those not living near a forest. In Mayo almost as high a proportion of those not living close to a forest were as opposed to forestry as those who were living in close proximity to a forest. These responses in both areas suggest that proximity to a forest *per se* is not a very cogent reason for being opposed to forestry.

By the same token the perceived advantages of living close to a forest were given as improving the landscape and providing an amenity in Wicklow while significant numbers referred to the shelter which it provides. The corresponding responses in Mayo were more economic in character and the environmental reasons were less frequently mentioned.

Forestry and Farming

Land owners were asked if any area of their own land was forested. In the Wicklow area 5 out of 58 landholders replied in the affirmative while in Mayo the corresponding reply was 14 out of 151, a fairly similar proportion in both instances. In most cases only relatively

small areas were planted, this especially being the case in Wicklow where the majority of the plots were less than 2 hectares. In the Mayo area there was a much wider distribution with more than half those reporting land forested having planted more than 4 hectares, but as expected the vast majority had afforested in the past 4 years. Sitka Spruce was the dominant species planted. Only about one-quarter reported having yet received the forest premium however. There was some evidence of unenclosed land being forested in Wicklow but not in Mayo.

Landholders were asked if they had any firm plans to plant any of their farm in the near future. In this instance 8 out of 58 farms in Wicklow and 13 out of 147 farms in Mayo intended to plant some land. (In the Mayo sample 2 farms were totally afforested). The intended lot sizes were still relatively small - only 4 out of 21 holdings were planning to plant more than 8 hectares while a further 6 were in the 4-8 hectare category. There was an equal preference for "contract" and "own planting" in Mayo while in Wicklow own planting was the strongly preferred option. In regard to the intention to plant trees, the availability of grants and premia, the outlook for farming and the quality of land for agriculture were the reasons offered with the last mentioned being cited more often in Mayo.

The number with definite plans to sell land for forestry was quite small and confined to 4 in the Mayo sample although the planned sale lots were in the 4-8 hectares category. The expected price averaged about £1,500 per hectare. Coillte was the preferred purchaser and the main reason cited for selling was that the land was poor for farming.

Finally landholders were posed questions concerning the suitability of land for forestry and agriculture. The particular question focused on here was what proportion of land is considered poor for agriculture but suitable for forestry. The responses are outlined in Table 20.

Table 20: *Proportion of Land Considered Poor for Agriculture but Suitable for Forestry*

Percentage of Land	*East*	*West*
	Per cent of Respondents	
0-9	51.7	55.6
10-24	8.6	14.4
25-49	19.0	14.4
50+	20.7	15.7
Total	100.0	100.0

Over 50 per cent in both areas considered that somewhat less than 10 per cent of their farms was poor for agriculture but suitable for forestry but significantly, about 21 per cent in Wicklow and 16 per cent in Mayo considered that more than half their farms were in that category. This seems at variance with the earlier shown low propensity to plant or sell land for forestry which might indicate a reluctance to afforest despite the personal evaluation of the worth of the land.

Chapter 8

IMPLICATIONS OF SCALING UP AFFORESTATION IN WESTERN AREA

As stated above about 22 per cent of the land in the Wicklow study area is under forest while the proportion in the Western area is currently between 4 and 5 per cent. We now examine the implications for employment, and incomes at 1988-92 costs and prices of a regime under which 25 per cent of the land area in the West would be afforested. The assumed increase is from 660 hectares to 3,748 hectares producing about 61,000M^3 of timber annually under a mature forestry regime.

The negative effect on agricultural output of diverting approximately 20 per cent of the *non-forested* land area *to* forestry will depend on the nature and quality of the land used and the present use and intensity of such land in agriculture. Where potential forestry land is in agricultural use at present it is more likely to be in extensive grazing, or some could even be lying derelict - a practice which is apparently fairly widespread in this area. It is assumed here that relatively little of the *"remainder"* category of land in Table 6 which includes areas under bog, would be planted; this category represents 14 per cent of the land of the Western study area. Thus the bulk of the land would necessarily have to come from the *rough grazing areas*. The latter currently accounts for 13 per cent or nearly 2,000 hectares which, in all probability are very lightly stocked at the moment if at all. The remainder of the required area to reach a target of 25 per cent would then have to come from the hay/pasture category (as tillage is practically non-existent). This would reduce the area under this category by about 7 per cent, on the assumption that a small part of the land classed as *remainder* would be planted, equivalent to 2 per cent of total land area. The land utilisation under the existing and new regimes is shown in Table 21.

Table 21: *Land Utilisation in Study Areas under Existing and New Regimes*

	Existing		*New*
	East	*West*	*West*
		hectares	
Crops/pasture	6,812	10,495	9,656
Rough grazing	3,716	1,949	-
Other land	1,084	1,889	1,589
Forestry	3,300	660	3,748
Total	15,482	14,993	14,993

We next have to estimate the impact on farm incomes of increasing the proportion of land under forestry to 25 per cent, through its effects on livestock numbers, which essentially means non-dairy cattle.

If the planting target could be realised without any reduction in livestock numbers, by tightening up on stocking rates, the impact on agricultural incomes and employment in the

area would be practically negligible. At the other extreme, a reduction in livestock numbers proportionate to the reduction in land used for agriculture would be of the order of 7 per cent. Having inspected the area we concluded that the 25 per cent target for afforestation could be achieved with a reduction in livestock numbers of the order of 5 per cent. This would be equivalent to a fall in farm income of about £110,000 per annum for the area.

We next address the question of whether the additional areas would be planted by Coillte, private investors, or farmers. This issue is important in determining the income from the forest premium. The national proportions at present as between state, farmer and private investment plantings are 42 per cent, 42 per cent and 16 per cent, respectively, in 1991. Indications from the area at the moment suggest a fairly even divide as between the three categories. On this basis and on the assumption that all of the land planted in the area is enclosed, the annual income from the premium is estimated at about £35,000 (an average premium of £75/hectare is assumed) which allows for some part-time farmers receiving reduced premia).

To this must be added the impact of forestry establishment, maintenance and harvesting on employment and incomes in the area on the basis of the employment potential of such activities and the contribution of processing to the selected and/or wider area. A number of scenarios could be addressed depending on which point in the production cycle the activity of the forest is measured. For the purpose of this study we assume a mature forest situation where there is an ongoing process of reforestation, maintenance thinning, harvesting and processing. Under this regime about 94 hectares would be clear felled and replanted every year. The method of calculating the income arising and the employment generated by this regime is shown below.

Income Arising and Employment from Forestry in the Western Area Under the New Regime

The annual income arising from a mature forest under the new regime is defined as the value of the timber extracted and processed in some selected year, plus the planting grants and premia received in the year by planters, less the non-labour expenses incurred in that year in growing, extracting, transporting and processing the timber produced. These expenses include depreciation so that income arising is equivalent to net value added. A Yield Class[4] of 20 is assumed and a 40 year rotation so that in a mature forest $^1/_{40}$th of the area is clear felled every year. If the felled area is replanted immediately the volume of output and expenses remain constant from the 40th year onwards. The calculations are made therefore for the 40th year.

The income arising is calculated in two phases. The first phase covers the growing of the timber and its delivery to the sawmill or processing plant using sawmill gate prices. This phase covers all operations in the forest plus transport from the forest to the mill. The second phase covers the processing of the timber and may be outside the study area.

[4] Yield Class is defined as the average yield of timber in M^3 per hectare per annum from a given forest over its lifetime. A Yield Class of 20 means that an average yield of 20 M^3 per annum will be obtained from a forest.

Income from the Forest and Haulage Operations

The annual output and expenses are calculated as shown in Table 22. Taking first a 40 hectare area of land, with one hectare planted every year, the whole area will be planted in the 40th year, and one hectare will be clear felled in that year also. The timber produced from the clear filled area[5] will be 35 M^3 of pulpwood (7-14cm diameter), 65 M^3 of pallet wood (14-20 cm diam.), and 315 M^3 of sawlogs (20+ cm diam.). In addition 5 other hectares will be thinned in that year producing 136 M^3 of pulpwood, 126 M^3 of palletwood and 91 M^3

Table 22: *Calculating Annual Income Arising from 3,748 Hectares of Mature Sitka Spruce Forest at 1989-1992 Factory Gate Prices (Yield Class 20: Rotation 40 years)*

		Type of Timber Sold			*Total*
	Unit	*Pulp-wood*	*Pallet-wood*	*Sawlogs*	
Output					
Timber extracted annually from 40 hectare forest in 40th and subsequent years*	M^3	145	162	345	652
Factory gate prices £/M^3	£	23.2	35.8	44.6	37.2
Timber extracted from 3,748 hectare forest					
Quantity	M^3	13,586	15,179	32,326	61,091
Value	£	315,218	513,050	1,441,784	2,270,052
Planting Grants		3,748	3,748	3,748	88,257
Premia Payments		3,748	3,748	3,748	34,874
Total Annual Output in 40th and subsequent years					2,393,183
Non Labour Expenses†				*per 40 hectares*	*per 3,748 hectares*
Cultivation and Drainage				80	7,496
Plants and Planting				243	22,769
Fertilisation and Weeding				108	10,120
Fencing				75	7,028
Brashing				7	656
Roads and Road Repairs				170	15,929
Insurance				490	45,913
Marking and measuring of thinnings				20	1,874
Harvesting and extraction				2,512	235,374
Haulage				2,282	213,823
Total non labour costs				5,987	560,982
Income arising (net value added)					1,832,201

Notes: * Yield figures taken from Forest Management Tables (Metric) Booklet No. 34 Forestry Commission 1991 less 15% to allow for roads, windblow and other losses.

† Taken from Coillte Teo 1990 The Case for Afforestation. Submission to the Independent Expert Committee on the Use of Bord na Mona Cutaway Bogs.

[5] Timber yield figures are taken from Forest management tables (metric) Booklet No. 34 Forestry Commission 1971. The dimensions as given in these publications are adjusted from 14-24cm for palletwood and from 24cm+ to 20cm+ for sawlogs.

of sawlogs. The total production of timber in the 40th year is thus 171 M^3 of pulpwood, 191 M^3 of palletwood and 406 M^3 of sawlogs. In subsequent calculations these amounts are reduced by 15 per cent to allow for roads, windblow and other losses so that the effective yield from the mature 40 hectare area in the 40th year is 145 M^3 of pulpwood, 162 M^3 of palletwood and 345 M^3 of large sawlogs giving a total yield of 652 M^3.

Applying these output figures to the total area of 3,748 hectares gives a total timber output of 13,586 M^3 of pulpwood, 15,179 M^3 of palletwood and 32,326 M^3 of sawlogs. Because timber prices were very depressed in 1992 we valued the output at average 1988-1992 prices expressed in 1992 money terms (see Table 22). This valuation gave a figure of £2.270 million for the total output of the timber in that year.

The premia which are paid to farmers only are estimated at £34,874 per annum, while the planting grants which are paid to all planters come to £88,257 (per ha. planting grant limits are estimated at £1,100 for farmers, £906 for other private planters and £841 for Coillte). Adding the grants and premia to the value of the timber gives a total annual output of £2.393 million.

The non-labour expenses cover drainage, planting, fencing, weeding, fertilisation, brashing, roadmaking, maintenance, thinning, clear felling, extraction and transport to the mill. These expenses are estimated initially for the 40 hectare area and are then increased in the ratio of 3,748/40 = 93.7 to give the numbers shown in Table 22 which add to £561,000. Deducting these figures from that for total output gives an income arising of £1.83 million for this phase of the operation. This works out at about £489 per hectare.

The annual labour required at the present time for all the above operations is estimated at 1.14 man years per hectare clear felled, or 107 man years for the total area clear felled (93.7 ha). Valuing this labour at £11,000 per man year gives a labour cost of £1.177 million. This leaves about £655,000 or £175 per hectare of forest to cover interest on capital, management and other overheads.

Income from the Processing Operation

The income arising in the timber processing sector is calculated as shown in Tables 23 and 24. The coefficients used in these tables are based on data obtained from a number of sawmills, from Coillte and the IDA. Table 23, which gives the disposal of the timber in the mills in volume terms, shows that from 47,505 M^3 of sawlogs and palletwood, the sawmill produces 23,450 M^3 of sawn boards and stakes, 16,626 M^3 of chips, 4,100 M^3 of sawdust and 3,327 M^3 of bark. The boards and stakes are sold to industry and to farmers; the bark is sold for horticultural purposes, but the chips and sawdust, which are intermediate products, are sold to the pulp mills, where, along with the pulpwood from the forest, they are converted into chip and fibre boards.

Table 23: *Disposal of the Timber from Western Study Area in the Different Mills in Volume Terms*

	Sawmills	*Pulp Mills*	*Total*
		Cubic Metres	
Inputs from forest			
Sawlogs	32,326		32,326
Palletwood	15,179		15,179
Pulpwood		13,586	13,586
Sawmill Residues		16,626	
Chips		4,104	16,626
Sawdust			4,104
Total inputs	47,505	34,317	81,822
Outputs from Mills			
Large sawn timber	16,163	3,327	16,163
Small sawn timber and stakes	7,286	3,327	7,286
Chips[1]	16,626	3,327	16,626
Sawdust[1]	4,104	3,327	4,104
Bark[2]	3,327	3,327	3,327
Fibre and chip board	3,327	13,726	13,726
Gross Output	47,506	13,726	61,232
Net Output of useable timber and bark	26,776	13,726	40,502

Notes: [1] Chips and sawdust produced as sawmill residues are sold to the pulp mills where they are manufactured into fibre board and chipboard.

[2] The bark from the sawmills is sold for horticulture. The bark from the pulpwood purchased directly from the forests is burned to provide heat in the mills.

The various transactions in Table 23 valued at average 1988-1992 prices expressed in 1992 money terms, and the associated costs, are given in Table 24. Reference to this table shows that the total non-labour expenses in all the factories comes to £4.6 million. Total revenue from all sales comes to £5.7 million giving a net value added from the processing operation of about £1.1 million. The estimated labour cost of the whole operation is £618,000 indicating about 55 man years of employment in the mills. The value added in the sawmills is £606,000 while that in the pulpmills is £480,000.

Combining the forest and the processing operations gives a net value added (income arising) of £2.918 million or £48 per M^3 of timber harvested. The employment content is estimated at 163 man years. This works out at one man year per 23 hectares of forest. The employment content under the existing and new regime in the western study area is shown in Table 25. In preparing this table, we assume that, because of underemployment in the agricultural sector the numbers employed would decline by 104. Some of these would take up employment in forestry. The remainder would retire as in the normal course of events and would not be replaced in the sector. However, the numbers leaving agriculture would be more than balanced by an increase of 152 people in forestry. It is impossible to say how the new labour force would be distributed. For simplicity we assume that half of those leaving agriculture will take up employment in forestry and the remainder will retire within the area. Of the remaining forestry workers 50 are assumed to come from outside the area and the balance from the unemployed workers in the area. The reduction of the numbers unemployed is, however, unlikely to reduce the magnitude of the government transfers. The retired farmers

remaining in the area are likely to receive pensions equivalent in value to the reduction in smallholders' assistance.

Table 24: *Calculating the Income Generated by the Timber from the Western Study Area in the Processing Sector*

	Sawmills	*Pulp Mills*	*Total*
		£'000	
Inputs from forest			
Sawlogs	1,442	513	1,442
Palletwood	513	513	513
Pulpwood	513	315	315
Sawmill Residues		356	
Chips		66	356
Dust			66
Total Inputs	1,955	737	2,692
Other Non-Labour Costs			
Variable costs	204	578	782
Fixed overheads including depreciation	400	310	710
Transport out	165	228	393
Total Non-Labour Costs (A)	2,724	1,853	4,577
Revenue			
Sales of large saw boards	2,150		2,150
Sales of small saw boards and stakes	825		825
Sales of chips and dust	343		343
Sales of bark	12		12
Sales of chip and fibre board	12	2,333	2,333
Total revenue (B)	3,330	2,333	5,663
Net value added (B)-(A)	606	480	1,086
Estimated labour cost	351	267	618
Margin	255	213	468

Table 25: *Employment Situation under Existing and New Regimes in Study Areas*

	Existing		*New*
	East	*West*	*West*
		Number	
Agriculture	205	504	400
Forestry (Production)	69	11	107
Forestry (Processing)	171	-	56
Manufacturing	35	70	70
Building and Construction	26	84	84
Services	97	76	76
Public Administration	63	84	84
Other	17	15	15
Total at work	683	844	892
Unemployed	172	182	132
Labour Force	855	1,026	1,024

The distribution of incomes under the existing and new regime is given in Table 26. This table shows that under the new regime income arising in agriculture in the West would fall from £2.040 million to £1.930 million while income from forestry including forestry processing would increase to £2.918 million from £72,000. The incomes arising in the other sectors are assumed to remain unchanged. As a result of the increase in forestry income, total income arising in the West under the new regime would rise from £9.349 million to £12.085. Average income per person 15 years and would increase from £4,187 to £5,411. It is obvious from these data that a forestry programme as outlined here would be very worthwhile.

Table 26: *Distribution of Income Arising in the Study Areas Under Existing and New Regime*

	Existing		*New*
	East	*West*	*West*
		£000	
Agriculture	1,266	2,040	1,930
Forestry	4,250	72	2,918
Industry and Services	1,695	2,102	2,102
State Transfers	2,801	4,510	4,510
Other	844	625	625
Total	10,856	9,349	12,085
Average income per person 15 years and over (£)	6,722	4,187	5,411

Chapter 9

FORESTRY AND RURAL DEVELOPMENT ON A NATIONAL SCALE

In considering the way in which forestry can contribute to rural development on a national scale it is necessary to have some idea of the amount of land which might be made available for forestry purposes. Since this enterprise tends to be undertaken, initially at any rate, on land which is not intensively used for agriculture it is important to know the amount of such land in the country. The intensity of land use in the state is examined below.

Intensity of Land Use

The total land area of Ireland is estimated at 6.889 million hectares while the grassland area, including rough grazing, is 4.050 million hectares. As tillage farming is almost exclusively concentrated on the best land and is a minority activity in most areas of the country we are here focusing on the intensity with which the grassland or forage area of the country is used by grazing livestock. This indication of intensity is measured as the number of grazing livestock units per hectare of grassland (stocking rate). In calculating stocking rates, two definitions of grazing livestock are used depending on the purpose for which the figures are required. Normally, all domestic grazing livestock are taken (cattle, sheep, horses, goats, etc.) and compared with the areas on which they graze. The rates so obtained are referred to here as total stocking rates.

Using the other definition, only bovine animals over 6 months of age other than heifers, plus ewes are used in the calculations. This is the definition used in the EC extensification programme where premia are given to farmers who have stocking rates of less than 1.4 of these livestock units per hectare, referred to here as EC stocking rates. The Teagasc National Farm Survey (NFS) is used to provide the distribution of these rates. The estimates are given in Table 27 where rates in the East and West regions[6] of the State are compared.

For the country as a whole about 30 per cent of the grassland area is on farms which have a stocking rate of less than 0.8 grazing livestock units per hectare while only 5 per cent of the land area is stocked at 2 grazing livestock units and greater. The situation is even more extreme in the Western region where 42 per cent of the grassland area is in the very lightly stocked interval of 0.8 livestock units or less. The main conclusion to be drawn from these figures is that a very high proportion of the grassland area is maintaining very low stock numbers and is yielding very low incomes relative to higher stocked farms. There would seem to be adequate scope therefore for "tightening up" or concentrating stock numbers on smaller areas of such farms and possibly releasing land for purposes such as afforestation, thus enhancing the returns from such holdings.

[6] These regions should not be confused with the study areas examined above.

Table 27: *Distribution of Grassland Area by Stocking Rate (LU/ha),[1] 1990*

Stocking Rate	*West*[1]	*East*[1]	*Total*	
	%	%	%	*Hectares ('000)*
< 0.8	42.1	17.0	29.7	1,208
0.8 - 1.0	16.9	9.7	13.4	542
1.0 - 1.2	14.4	13.9	14.1	570
1.2 - 1.4	13.4	15.0	14.1	570
1.4 - 1.6	6.0	13.1	9.5	384
1.6 - 1.8	4.3	13.6	8.8	356
1.8 - 2.0	1.5	9.3	5.3	214
2+	1.4	8.3	5.1	206
All	100.0	100.0	100.0	4,050

Source: NFS files, Teagasc.
Note: [1] As defined in NFS. See text.

The areas involved are substantial. Table 27 shows that 2.89 million hectares of grassland have stocking rates of less than 1.4 livestock units and are, therefore, eligible for the extensification premia. In general, however, incomes on most of these areas are very low and in a considerable number of cases all the livestock could be carried on much reduced areas without breaching the extensification limit. This would leave substantial areas available for forestry.

It has to be recognised, of course, that much of this land may not be suitable for forestry or that the surplus areas involved may individually be too small for commercial afforestation. Nevertheless, based on the current level of stocking intensity, over one million hectares of grassland, yielding very little in their present use would be more productive if devoted to forestry.

Of course this line of reasoning does not preclude the potential economic possibility of transferring land farmed above the extensification threshold to forestry. However, because of the correlation between the level of stocking and income, there would be a decreasing possibility of higher income farms being considered for afforestation from a purely financial viewpoint.

The actual relationship between stocking rate and family farm income is depicted in Table 28, and while there are secondary reasons such as the type of farming system and livestock productivity which also impact on returns, stocking intensity is a critically important factor influencing returns per unit of land.

It should also be pointed out that participating farms in the NFS only include those which have some livestock and crop activity. Farms appearing in the sample which are derelict or not farmed are not included in the survey. Consequently the NFS results would underestimate the extent of very extensively and unfarmed land in Ireland. There is some evidence that the area of very lowly stocked farms but particularly derelict or abandoned

farms is increasing as indicated below, although such farms would tend to be of poorer quality.

Table 28: *Relationship Between EC Stocking Rates and Income in 1991*

Stocking Rate	*Income/ha*[1]
(LU/ha)	*(£)*
< 0.8	75
< 0.8 - 1.0	170
1.0 - 1.2	198
1.2 - 1.4	262
1.4 - 1.6	298
1.6 - 1.8	387
1.8 - 2.0	401
2.0 - 2.2	478
2.2+	556

Source: NFS files:
Note: [1] Family farm income/ha of Utilised Agricultural Area (UAA)

An indication of the trend in the number and proportion of "unclassified" holdings can be gleaned from the Farm Structures Surveys undertaken on behalf of the EC (Table 29).

Unclassified holdings consist almost entirely of holdings on which there were no livestock at the time of survey and where the area used for agriculture consisted of fodder crops (i.e., mainly permanent pasture or meadows, or rough grazing). It is not clear whether the situation of these holdings is of a permanent or temporary nature (O'Hanlon 1987), but whether or not, Table 29 indicates that the number of holdings, with virtually no agricultural activity is increasing. Also the majority of these holdings are in the less-favoured areas and they could account for about 200,000 hectares. If these figures are added to the estimated areas of the very lowly stocked farms in Table 27, they would increase the areas available for forestry fairly substantially.

Table 29: *Number of Unclassified, Classified and Total Holdings in Ireland 1975-1987*

	1975	*1980*	*1987*
		No.	
Total holdings ('000)	228.0	223.3	216.9
Unclassified ('000)	9.1	14.0	22.3
% unclassified	4.0	6.3	10.3

Source: Farm Structure Surveys, Eurostat.

Forestry and Rural Employment

Rural areas are constantly losing jobs because of the inexorable decline in the agricultural labour force. At the national level the pattern of decline in the farm labour force is shown in Table 30.

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, a phenomenon common to other EC countries as well. Generally speaking the rate of decline in the population of specific rural areas is correlated with the proportion of the labour force in agriculture at the beginning of the period. Thus the more "rural" the area the greater the migration and population decline.

Table 30: *Evolution in National Farm Labour Force*

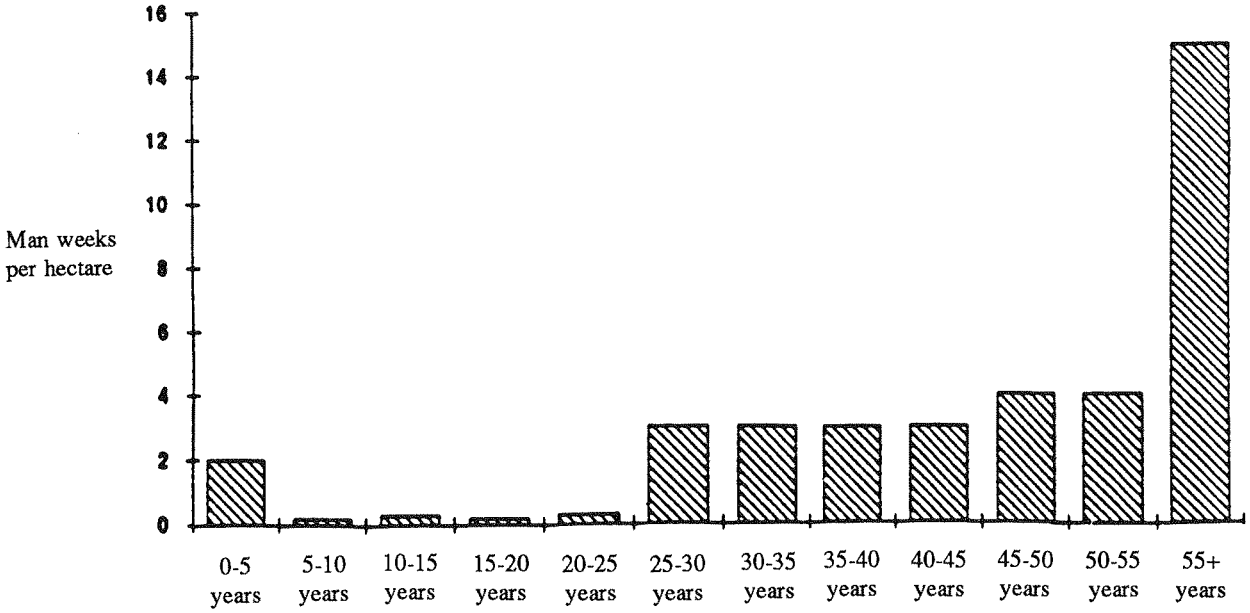
Year	*Agriculture*		*Total*
	('000)	*% of Total at Work*	*at Work ('000)*
1971	272	25.9	1,049
1981	196	17.1	1,146
1982	193	16.8	1,146
1983	189	16.8	1,124
1984	181	16.4	1,103
1985	171	15.8	1,079
1986	168	15.5	1,081
1987	164	15.1	1,084
1988	166	15.2	1,091
1989	163	15.0	1,090
1990	167	14.8	1,126
1991	154	13.7	1,125
1992	150	13.3	1,125

Source: Economic Review & Outlook, and Labour Force Surveys.

It is in this context that forestry must be placed from a longer term perspective. Together with other developments like farm diversification, agri-tourism, small and community enterprises, forestry is now being actively promoted to, *inter alia,* provide rural employment. However it is an unreasonable claim that forestry ought not to be promoted because it is not labour intensive in the short term. As is illustrated in Figure I (Grundy *et al.,* 1989) the relatively low labour content of forestry in the early years might be unappealing in terms of employment creation, but since generally it does not depress other activities, it is at least additive. It is also important as a longer term and renewable venture, and generally will occur in areas which would not attract other job opportunities.

The illustration in Figure 1 showing the pattern of employment over the 55 year+ rotation of a conifer forest indicates that employment falls to very low levels after the first

Figure 1: *No. of Man Weeks per Hectare in the Development of a Forest*



5 years and does not build up again until thinning commences and more sharply upward again as harvesting, haulage and processing begins. The example given could be reproduced for the more productive Irish forests by advancing the peaks in employment shown by 10-15 years. In the Figure an average of 2 man weeks per hectare per annum of forest is required in the planting period (years 0-5), very little in years 5-25, 3 man weeks per hectare (years 25-45), 4 man weeks per hectare (years 45-55), and 15 man weeks per hectare (55+). The Forest Commission Study which produced these coefficients indicates that with the present state of forestry in the UK, the employment pattern shown above translates into an average ratio of harvesting to other forest workers of 2:1.

The issue of whether job losses in agriculture can be compensated for by the development of forestry is a multi-faceted question. In a particular situation in Scotland this did indeed materialise (McCreath, 1988), but one could envisage other situations where this would not happen.

The development of forestry could occur without significantly increasing employment in rural areas while at the same time raising income. This could happen by the development of part-time or seasonal jobs, thus reducing *underemployment* on farms, which is quite pervasive, especially in marginal areas. Therefore, it could be misleading to view forestry exclusively in employment creation terms when some of the effects could be in reducing underemployment rather than creating new jobs. In essence then forestry can play a significant part in raising rural incomes and stabilising the population even if not expressed explicitly in the creation of extra jobs.

Impact of Alternate Proportions of Land Area Under Forestry on the Rural Economy

At present about 6.5 per cent of the land area of Ireland is afforested and the pace ofafforestation is proceeding at a rate of about 0.3 per cent per annum. The diversion in land use to forestry does not seem to have had any perceptibly negative impact on agricultural production or the agri-food economy generally while the additional forestry activity has been beneficial to the economy in terms of employment, value-added and exports. The present forest area however is yielding well below its potential in terms of actual production given the relatively young age of the national forest estate, much of which has as yet negligible output volume. Thus the current scale of economic and social activity arising from forestry understates the potential activity which the existing forest estate would yield in a mature or steady state situation.

Taking due account of this fact we consider the implications for the rural economy of successively larger forest areas. The forest areas postulated here would represent 10 per cent, 15 per cent and 20 per cent of the land area of Ireland which would be equivalent to 689,000, 1,033,000 and 1,378,000 hectares respectively. With increasing areas of land being afforested significant changes would be occurring, particularly in terms of forest productivity, while the impact on agriculture may be more evident. The additional afforestation would be occurring on "better" quality land which in turn would give higher yielding forests or better quality but lower yielding tree species. At the same time agricultural production would be increasingly affected with the encroachment of forestry on to progressively higher stocked land areas. The main problem however is to determine how much agricultural activity is depressed or excluded as afforestation is increased or whether there would be scope for "tightening up" or concentrating stock numbers on smaller areas of land provided such a strategy did not breach the extensification threshold introduced in the CAP reform.

A perusal of the stocking rate data in Table 27, suggests that livestock numbers would not have to be reduced to accommodate an increase in forestry to *10 per cent of the land area.* The main qualification here is that in practice if the increase in forestry were to take place on the basis of concentrating planting on the unstocked and least stocked lands first, the ensuing forestry pattern could display a very large number of small areas. Some good land might therefore have to be planted in order to link up the small plantations.

In moving to an area of forestry representing *15 per cent of the land area* there is an increasing likelihood that better land would be planted and that such land could be carrying significant numbers of grazing livestock. Some of these livestock would probably be retained on other farms or smaller areas of existing farms but we estimate that a reduction of about 115,000 livestock units would take place in such a situation. This reduction would reduce the agricultural and food processing income by about £13 million.

A final target of achieving *20 per cent of the land under forestry* would certainly involve more displacement of, or reduction in livestock numbers, as forestry progressively moves on to land classed as pasture. As in the previous situation some of these livestock might be retained on other farms or on smaller areas of existing farms. However, the likelihood of this happening is not very great and we make the arbitrary assumption that a reduction of one livestock unit per hectare, or a total of 345,000 units, would be required. The

estimated reduction in the agri-food industries as a result of this development is estimated at £40 million.

In regard to the impact on wood production, we assume that as forestry is scaled up progressively to 10 per cent, 15 per cent and 20 per cent of the land area, Yield Class will also increase from an average of approximately 16 for the present area of forest to 18 and 20 for the succeeding tranches. The estimated incremental production of timber from mature forests using 40 year rotations, as the respective bigger planting targets are achieved, is outlined in Table 31. The method adopted in preparing this table is the same as that used in preparing Table 22 for the Western study area. A reduction of 15 per cent has been made for open spaces and roadways in the forest as in Table 22 also. Projected production levels assume predominantly conifer forests. These levels would reduce considerably as conifers are replaced by broadleaved plantations.

Looking at Table 31 we note that when 10 per cent of the land area of the State is planted the area under forest will be 689,000 hectares made up of the present area of 450,000 ha and an additional area of 239,000 ha. Total annual timber production from the latter area under mature forest conditions is estimated at 3.657 million M^3. When 15 per cent of the land area is planted the total area under forest is 1.033 million ha representing an increase of 344.5 ha over the 10 per cent figure. The annual extra timber production, under mature forest conditions, from this increment of planting is 5.856 million M^3 or a total of 9.513 million M^3 over current production.

Table 31: *Annual Incremental Production of Timber from Mature Sitka Spruce Forests with Different Planting Targets*

	Proportion of Land Area Planted %			*Total of*
	10	*15*	*20*	*Increments*
Yield Class	18	20	20	-
Type of Wood Produced	*Annual Incremental Production (000m³)*			
Pulpwood	505	808	808	2,121
Palletwood	713	1,142	1,142	2,997
Sawlogs	2,439	3,906	3,906	10,251
Total volume	3,657	5,856	5,856	15,369
Incremental area ('000 ha)	239	344.5	344.5	928.0
Actual area ('000 ha)[1]	689	1,033	1,378	1,378

Note: [1] Area under forest at end of 1992 is estimated at 450,000 hectares.

When 20 per cent of the land area is planted the total area under forest is 1.378 million hectares representing a further increase of 344.5 ha over the 15 per cent figure. The annual extra timber production from this increment of planting is 5.856 million M^3. When production from the different increments are aggregated the total output is 15.369 million M^3 in excess of the current level of production.

Income Arising from Successive Increments of Forestry

The net value added (income arising) from the different increments of forest products is calculated in Table 32 using the same method and the same series of prices as for the increased forestry regime in the Western study area. Table 32 shows that if 10 per cent of the land in the state were put under forest the extra income arising would amount to £168 million which is somewhat less than 1 per cent of the 1991 net domestic product at factor cost (National Income). Of this amount £110 million is generated in production, harvesting and transport of timber to the factory gate. The remaining £58 million is generated in processing the wood. Subsidies (Planting Grants and Premia) which are included in the value added figure are estimated at about £2 per M^3. If these were excluded the value added figure would be reduced by about £7 million to £161 million.

Table 32: *Calculating Annual Net Value Added in the National Economy from Successive Increments of Sitka Spruce Forestry*

First Increment to 10 per cent (Yield Class 18)	*Unit*	*Pulpwood*	*Palletwood*	*Sawlogs*	*Total*
Production from forest[1]	000M^3	505	713	2,439	3,657
Net Value Added to Factory Gate [2]	£000	-	-	-	110,173
Net Value Added in Processing	"	17,831	8,625	31,824	58,280
Total Net Value Added to 10%	"				168,453
Second Increment 10 to 15 per cent (Yield Class 20)					
Production from forest[1]	000M^3	808	1,142	3,906	5,856
Net Value Added to Factory Gate[2]	£000	-	-	-	175,680
Net Value Added in Processing	"	28,547	13,818	50,973	93,338
Less Loss to Agri-Food Industry	"				-13,000
Total Net Value Added to 10-15%					256,018
Third Increment 15-20 per cent (Yield Class 20)					
Production from Forest[1]	000M^3	808	1,142	3,906	5,856
Net Value Added to Factory Gate[2]	£000	-	-	-	175,680
Net Value Added in Processing	£000	28,847	13,818	50,973	93,338
Less Loss to Agri-Food Industry	£000	-	-	-	-40,000
Total Net Value Added to 15-20%		-	-	-	229,018
All Increments					
Total Net Value Added to 20%					653,487

Notes: [1] Net value from forest production to factory gate is estimated at £30 per M^3 of all timber produced.

[2] Net value added in processing is estimated at:-
£13.05 per M^3 of large saw logs processed
£12.10 per M^3 of pallet wood processed and
£35.33 per M^3 of pulpwood delivered from forest.

If 15 per cent of the land were to be put under forest the extra income arising from this 5 per cent increase would amount to £269 million offset by a reduction of £13 million in the agri-food industry giving a net value added of £256 million. If this is added to the £168 million quoted above the increase over the present income from forestry is £424 million. The subsidies included in this total amount to about £19 million.

When 20 per cent of the land is under forestry the extra income arising from this increment is again £269 million but this is offset by a reduction of £40 million in the agri-food sector giving a net value added for this increment of £229 million. Adding this to the previous increments gives a total over the present income level of £653 million which is about 3.0 per cent of the 1991 net domestic product at factor cost. Total subsidies included in this income are about £32 million.

The labour requirements for this programme are given in Table 33. In calculating these requirements we have used a figure of one man year per 571M^3 of timber harvested in the forest and haulage operations and one man year per 1,111M^3 of timber used in the processing sector. These are the labour requirements which emerged in the forestry calculations for the Western study area.

Because agricultural land is used for forestry the agricultural labour force will be reduced when allowance is made for this. The net labour requirements of the forestry increments are obtained by deducting the decline in the agricultural labour force from the forestry labour requirements.

Table 33 shows that the net labour requirements for the first increment of forestry is 9,694 units. We estimate no reduction in the agricultural labour force for this increment. The net labour requirement for the second increment of forestry is 14,337 man years. This is made up of a forestry requirement of 15,500 man years in forestry less a reduction of 1,200 man years in the agri-food industry. The third increment has a net labour requirement of 12,300 man years, made up of a forestry requirement of 15,500 and an agri food reduction of 3,200. Under circumstances where 20 per cent of the land area of the State would be under forestry the net labour requirement for the increased area over and above the present level would be about 36,400 man years made up of a forestry requirement of about 40,800 man-years and a reduced agri-food requirement of 4,400 man years.

Table 33: *Labour Requirements per Successive Increment of Forestry*

	Up to 10%	*15%*	*20%*	*Total*
		Man Years		
Labour required in Forestry & Haulage	6,403	10,266	10,266	26,935
Labour required in Timber Processing	3,291	5,271	5,271	13,833
Less reduction in Agri-Food	-	-1,200	-3,200	-4,400
Net labour requirements	9,694	14,337	12,337	36,368

These increases should not be interpreted to mean that a forestry programme would increase the combined labour force in agriculture and forestry. As stated above the farm labour force is declining at the rate of about 3 per cent per annum and this trend is likely to continue. A forestry programme could help to stem somewhat this rural decline but it cannot halt it entirely. There is still far too much under-employment in agriculture for this to happen.

Having said this, however, there would undoubtedly be a significant improvement in rural incomes from switching relatively unproductive farm land to forestry. Even a small

increase to 10 per cent of the land area under forestry would be very worthwhile. This area of mature forest would give an annual increase in national income of almost £168 million and would require a labour force of 10,000 people.

It should be kept in mind that the results presented in this paper relate to mature forests. For a current planter, however, maturity is 40 years down the road and a lot could happen in the meantime. Substantial incentives are needed, therefore, to get a forestry programme undertaken by private people. The increased planting grants, the acreage premia and the tax concessions are such incentives but it could well be that further enticements are needed. At current rates of planting it would take 50 years to achieve a forest domain of 20 per cent of the land area of the state and a further 40 years before a mature forest area of this size would be available. This is a scenario which is difficult to comprehend, but if a policy decision is taken to achieve such a level of forest at an earlier date, plans must be made now.

Timber prices must also be considered. In this study we have used average prices for 1988-1992 over most of which time timber was in strong demand. Had we used current depressed prices the results would not have been so favourable. Indeed because of reduced demand and poor prices many sawmills are now operating on short time and private planting has been severely curtailed in 1992.

Looking towards the future, however, the outlook is optimistic. Timber is a vital ingredient in the building industry which waxes and wanes with the business cycle. At the present time building in the developed countries is in the doldrums but when economic conditions improve, as they inevitably will, it will take off again and demand for timber and prices will increase. Planters can be assured, therefore, that over the long run, despite periodic hitches, timber prices will increase in line with inflation and probably at a greater rate as traditional forests in the USA, Canada and the Scandinavian countries, are being conserved.

In any case there is an urgent need to increase afforestation in Ireland, where up to one million hectares of land are producing very little in the way of agricultural output. Most of this land is eminently suitable for forestry and it should be put to productive use as soon as possible. However the Forest Service and Coillte must take a hard look at current planting practices, particularly in relation to species used. The current over-reliance on one species - Sitka Spruce - is dangerous from an environmental (acidification of water), biological (disease) and business point of view. In future years planting grants and forest premia should be tailored to get a more diversified species planting regime.

Chapter 10

CONCLUDING REMARKS

This study has highlighted the role which forestry can play in rural development as illustrated by its contribution to household income and employment in the Wicklow study area. While one cannot conclusively claim that employment and income levels would be that much lower in the absence of a forestry activity in the area, or that the population would be significantly lower, it seems clear that it is a very important element in maintaining household income levels and the fabric of the local community. By contrast the experience of the West study area is one of low incomes and the decimation of its population and social structure over the years.

Forestry is now being actively promoted as a basis for providing raw material for a forestry based industrial sector, for stimulating rural development and as part of the reform of the Common Agricultural Policy. The diversion of land to forestry, at a rate of 0.3 per cent per annum at present, is occurring without any apparent negative impact on agricultural output in the aggregate. A perusal of the stocking rate performance especially for marginal farming areas would seem to indicate that a high proportion of the utilised agricultural area is carrying low livestock numbers and is yielding very low incomes relative to better stocked farms. It would seem therefore that a considerable area of land, perhaps up to 1 million additional hectares, could be released from agriculture without seriously impairing agricultural output or incomes from farming. There is probably also a considerable amount of land lying derelict at the moment which has a definite zero opportunity cost in forestry. We do however recognise that some of this area while collectively large may be comprised of relatively small parcels and widely dispersed. This would undoubtedly reduce their value for commercial forestry but we are convinced there are contiguous blocks of land of sufficient scale for economic exploitation in a forestry programme. In this regard an appropriate land exchange programme could usefully be further promoted involving community participation whereby forestry could be developed on a planned basis so as to encourage the harmonious development of forestry and agriculture. This is being done under the Western Forestry Co-operative programme.

Another issue which arises in the context of forestry development relates to its employment potential particularly its contribution to present day labour market problems. It is often claimed that because of the nature of forestry it is not labour intensive in the short term and thus contributes little to the alleviation of *unemployment* or *under-employment.* This argument would have some validity if other sources of employment were readily available in the areas in question and/or if the expansion of forestry had a significant resource opportunity cost. In present circumstances neither of these conditions readily apply and while indeed there is a relatively low labour content in the early years, any employment generated is at least additive, does not depress other activities and most likely occurs in areas where alternative job opportunities would be hard to find.

There is also the issue of whether the decline in the agricultural labour force can be offset by the development of forestry. We think that this is too much of a burden to place on the forestry activity. In the first instance marginal farming areas in particular are characterised

by *under-employment* and thus an excess of labour. Second, the decline in the agricultural labour force is an inexorable process, again especially in marginal areas, and one which has not been possible to stem in virtually any region of the developed world. So, *irrespective of the rate of forestry development,* the farm labour force will continue to decline. Forestry could have a role in helping to retain some of those leaving agriculture and in reducing *under-employment* on farms, thereby assisting in stabilising the population and raising income levels.

The achievement of any given rate or level of afforestation is dependent on prevailing economic circumstances as well as on the particular policy mix designed to promote rural development. Unfortunately, the particular policy menu can contain internal conflicts and contradictions in relation to objectives. For instance certain social welfare policies reward the retention of land in a particular use while other policies could be having the opposite effect. The measures accompanying CAP reform which are described in Appendix B82 are worthy of comment in this context. While the *forestry measure* is likely to be beneficial to the national forestry programme, the *agri-environment measure* may have the opposite effect. This measure aims to give recognition to the dual role of farmers as producers and custodians of the countryside and to encourage less intensive farming. It could, however, restrict the availability of land for forestry because aid would be given to conserve or re-establish biological diversity and set aside land as conservation reserves and biotopes, and for extensification. The *farm retirement scheme* on the other hand may have a positive effect on afforestation by increasing the supply of land coming on the market, but the effect may be negligible. Together with the effect of the *extensification* measure described earlier certain of the socio-structural measures can therefore retard afforestation and temper the extent to which farmland values fall, which in turn would facilitate forestry.

A last issue to be noted here concerns public attitudes to forestry. Whereas in the West study area there was a significant opposition to forestry for economic as well as social reasons, such an attitude was little in evidence in Wicklow. The perception of forestry is highly correlated with its stage of development and/or with the rate of afforestation. Thus mature forest areas offer an opportunity of observing the significance of forestry in rural development which an incipient forestry programme cannot.

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APPENDIX A

APPENDIX A

(A) FORESTRY OPERATIONAL PROGRAMME SCHEMES

1. Afforestation:

- Grant levels up to 85 per cent of approved costs are paid to farmers/farmers co-operatives.
- Grants up to 70 per cent of approved costs are paid to *others.*
- Grants up to 65 per cent of approved costs are paid to *Coillte.*

The grant limits were raised in January 1992 to the following levels:

- £2,000 per hectare for broadleaves.
- £1,100 per hectare for conifers on enclosed and improved land.
- £900 per hectare for conifers on unenclosed land.

The grants are paid in two instalments:

- 75 per cent on satisfactory formation.
- 25 per cent 4 years from the date of the first instalment subject to satisfactory establishment.

2. Improvement of Woodland:

- Grant levels up to 85 per cent of approved costs paid to farmers/farmers co-operatives.
- Grants up to 70 per cent of approved costs are paid to *others.*
- Grants up to 65 per cent of approved costs are paid to *Coillte.*

The grant limits were raised in January 1992 to the following levels:

- £2,000 per hectare for broadleaves.
- £1,100 per hectare for conifers.

The grants are payable in two instalments as for the *afforestation* measure.

3. Reconstitution of Woodland:

- *Grant levels* as for the *afforestation* and *improvement* measures.
- *Grant limits* and *conditions* as for the *improvement* measure.

4. Forest Roads:

- Grant level of 80 per cent of approved costs for all applicants.

The grant level is £12 per linear metre of road and paid on satisfactory completion of the work.

5. Forest harvesting:

- Grant levels of up to 45 per cent of the approved costs for investment in equipment, payable when satisfactorily undertaken.

6. Back-up measures:

- Grant aid is unlikely to exceed 60 per cent of the eligible investment expenditure for studies/pilot projects on such themes as short rotation forestry, marketing initiatives and pilot demonstration projects as well as for aid to associations.

(B) FOREST PREMIUM SCHEME

This scheme was introduced in 1990 and related to afforestation work completed by farmers on or after 18 June 1989. The scheme initially applied to individual farmers whose annual off-farm income did not exceed £11,000 in any of the three income tax years prior to afforestation, who resided within a distance of 70 miles from the plantation and, who owned the land that was forested.

The initial rates of payment were:

Land unenclosed: £50 per hectare per year for 15 years.
Land enclosed and improved: £116 per hectare for the first 8 hectares, £86 per hectare thereafter per year for 15 years.
An upper limit of £6,000 per annum applies for conifers.
For land planted with *broadleaves* the rate of payment was £116 per hectare each year for 20 years with no upper limit.

From January 1992 the following adjustments have been made to the scheme:

Change in Off-farm Income Threshold

The amount of the premium will in future be based on the annual average industrial wage as published by the CSO, currently £14,300 per annum, instead of the limit of £11,000 per annum in 1990/91.

Annual Off-Farm Income above Threshold

A premium of £50 per hectare has been introduced. Previously, no premium was payable.

Annual Off-Farm Income below Threshold

For land which was previously enclosed and improved for agricultural purposes, the first 8 hectares planted will continue to attract an annual premium of £116 per hectare but the premium for each additional hectare was increased from £86 to £100 per annum.

Note: The Western Package Forestry Grants are being continued until their expiration and were brought into line with the Forestry Operational Programme and Forestry Premium Scheme.

(C) OPERATIONAL PROGRAMME FOR RURAL DEVELOPMENT - FORESTRY MEASURES

1. Recreational Forestry (provision of public recreational facilities):

- Grant levels up to 85 per cent of approved costs for farmers/farmers co-operatives.
- Grants up to 70 per cent of approved costs for others.

The grant limits are as follows:

- £2,000 per hectare for broadleaves.
- £1,100 per hectare for conifers.
- £350 per hectare for recreational facilities.
- £700 per hectare to public agencies for community involvement.

Grants are paid in two instalments: 75 per cent on satisfactory formation and 25 per cent four years later.

2. Forest nurseries:

- Grant levels and limits to be decided by Minister.

3. Back-up Farm Forestry Services:

- Support is provided to develop co-operative farm forestry, demonstration farm forests and promotion.

4. Forest training:

- Support for training courses in forest establishment and maintenance, forest harvesting and marketing.

APPENDIX B

APPENDIX B

Effects of CAP Reform on Marginal Land

Tillage and dairy farming systems are located on the better soils and provide the highest returns to the factors employed in the production process. The dominant farming systems on the medium to poorer quality soils are cattle and sheep. With respect to cattle systems the most numerous group is farms with beef cows mainly in the single suckling system. Omitting dairy farms, cattle farms with beef cows account for about 80 per cent of cattle herds and they appear to be more self-contained than other systems in terms of purchases in relation to sales. Such farms are even more significant on Western and more marginal farming areas. This system would thus be very representative of cattle production in the areas or on farms of interest.

A typical example of how the interplay of price reduction and compensation under the CAP reform will affect the margins in the single suckling system is illustrated in Table B1 for a moderate level of performance. The Table shows a comparison of the returns, pre and post CAP reform, for a representative single suckling system, selling forward stores (1.5 year old animals) for both severely handicapped and non-disadvantaged areas. The post CAP reform position relates to the final year of the transitional period, i.e., 1995/96, and a 15 per cent decline is assumed in sale cattle prices over the period. It is also implied in the exercise that the system would be operated at a stocking less than 1.4 livestock units per hectare and this is entirely reasonable given that the average stocking rate in this system is probably less than the threshold of 1.4, even with the inclusion of livestock which are not counted in measuring stocking rate in the CAP reform measures.

Table B1: *Comparison of Pre and Post CAP Reform Returns for Single Suckling*

	Pre-Reform		*Post-Reform*[1]	
	A	*B*	*A*	*B*
		£/cow		
Output (excl. subsidies)	376	376	320	320
Variable costs	198	198	193	193
Gross margin	178	178	127	127
Subsidies:				
Suckler cow	53	53	123	123
Headage	84	-	84	-
Beef premium	15	15	79	79
Extensification				
Cow	-	-	26	26
Male cattle	-	-	12	12
Total	152	68	324	240
Gross margin (incl. subsidies)	330	246	451	367

Notes: A = Severely handicapped areas; B = Non-disadvantaged areas.

[1] Subsidies would increase further when the full effect of the January devaluation of the Green Punt applies.

Given the assumptions which underpin the exercise, Table B1 clearly demonstrates that the gross margin will be significantly increased in both the disadvantaged and other areas of the country. In the former areas, the gross margin per cow increases from £330 to £451, while in the non-disadvantaged areas, the increase is from £246 to £367. Even excluding the extensification premia, which would represent the situation on the more extensive farms, the scale of the increase is still substantial, being £83 per cow in each instance, which is equivalent to an increase in gross margin of 25 per cent in the severely handicapped areas and proportionately more (33 per cent) in the other areas. The increase in terms of family farm income would be even greater in relative terms than in gross margin, but it is worth stressing again that the gains in incomes are proportionately greater in the better farming areas. It must be emphasised, however, that the change in margins or incomes such as that indicated in Table B1, is very sensitive to the scale of price decline assumed for cattle. In the above exercise a price reduction of 15 per cent was postulated and in a falling market the prices of younger cattle do tend to fall proportionately more than for older and heavier cattle. However it would require a decline of 47 per cent or greater in the sale price of the animals produced in the chosen system to leave such producers worse off, while any price decline of a lesser magnitude would tend to make the system more profitable.

As implied in the foregoing paragraph however, the effect of the reforms in terms of the distribution of returns will vary with the system of cattle production until a new equilibrium is reached. However the earlier analysis of the impact of the CAP adjustments showed that the cattle sector is the main beneficiary and thus the returns in all systems could improve even with a significantly greater decline than 15 per cent in beef prices. In the meantime, breeding-based systems which are mainly located on smaller farms and marginal areas of the country will fare relatively better from CAP reform while other systems such as summer grazing and finishing which are located on better soils and bigger farms will do relatively worse.

The effect of the CAP reform on the sheep sector is less certain to anticipate. It will however effectively curtail any further expansion in sheep numbers and could initially cause a slight reduction to the 1991 level. Furthermore, as indicated in the case of the single suckling system, the outcome for sheep producers will depend on the extent to which the decline in sheepmeat prices will be offset by the increase in the ewe premium. Some shortfall, as is the case at the moment, is probably inevitable so to that extent producers' incomes could decline somewhat or at least will not advance much from their rather depressed 1992 level. The position of hill and upland producers could be less severely affected by any shortfall because of the nature of the sheepmeat regime. In general however the sheep enterprise or mixed grazing (cattle/sheep) systems, will fare less well from the reform of the CAP than specialised, and particularly, breeding-based cattle systems.

The degree to which the CAP reforms differentially impact on particular farming systems and size has also been examined in a National Farm Survey context by Teagasc (Teagasc, 1992(b)). Their analysis shows that dairy farmers will neither gain nor lose from the adjustments - reduced milk prices being just about offset by increased cattle subsidies and reduced feed costs. Cattle farms will gain most from the reforms, confirming the conclusion from the budgeting exercise outlined above.

The Teagasc analysis shows substantial variations in the manner in which the reforms impact across size groups. In proportionate terms, smaller farms gain relatively more as shown in Table B2.

Table B2: *Effect of Reforms on Average Family Farm Income per Farm by Farm Size (£)*

Farm Size Group (ha)	*2-20*	*20-50*	*50-100*	*100+*	*Hill Farms*	*All*
				£		
Average FFI pre-reform	2,473	8,973	18,429	27,830	3,366	6,282
Average FFI post-reform	2,914	9,560	19,306	27,802	3,855	6,774
Gain (Loss)	441	587	877	(28)	489	492
% Gain (% Loss)	17.8	6.5	4.8	(0.10)	14.5	7.8

Source: Teagasc

While hill farms also gain more than the national average this analysis confirms that smaller farms in the more marginal farming areas will do relatively better from the CAP reforms than the larger farms in the better farming areas.

CAP Reform - Structural Measures

The measure instituting a Community aid scheme for **forestry** is one of three accompanying measures to the reform of the CAP. The other two concern *agriculture and the environment* and *early retirement* for farmers.

Forestry (Regulation (EEC) No. 2080/92)

In the explanatory memorandum to the draft legislation introducing the accompanying measures, it is stated that forestry measures can help to prevent the abandonment of farm land with a consequent risk of erosion and deterioration of the landscape, while at the same time provide alternative income sources for farmers and, in due course help to reduce the Community's timber deficit. Thus the measure consists of an aid scheme covering:

- investment in afforestation (including that carried out by local authorities)
- the upkeep of afforested land during the first five years
- an allowance to offset income losses over a maximum period of 20 years, varied according to the category of beneficiary and the species planted, and
- the improvement of existing stands of trees.

Member States are to implement the aid scheme by means of multi-annual zonal programmes which "reflect the diversity of environmental situations, natural conditions and the structure of agriculture". It seems therefore that national authorities would be allowed considerable flexibility in choosing that mix of strategies which they considered most relevant in their particular circumstances.

This forestry measure has been anticipated to some extent in the adjustments to the Forestry Operational Programme announced in January 1992 and further modifications are likely in the context of the new tranche of Structural Funds.

Farming and the Environment (Regulation (EEC) No. 2078/92)

The aim of this regulation is to give recognition to the dual role of farmers as producers and custodians of the environment and the countryside and to encourage less intensive farming. At the same time the measure would assist in achieving a balanced market. The regulation on production methods compatible with the protection of the environment and the maintenance of the countryside contains the following elements:

1. The substantial reduction of the use of "polluting" substances (fertilisers, herbicides, pesticides) or to keep to the reductions already made.
2. The reduction of livestock numbers (cattle, sheep) where damage is being done by excessive stocking, and the extensification of crop farming, including forage production.
3. The use of agricultural practices which conserve or re-establish diversity and quality in the countryside with respect to the landscape and the preservation of native fauna and flora.
4. The upkeep of abandoned land where this is necessary for environmental reasons or because of natural hazards or fire-risks; this would apply also to non-farmers living in rural areas.
5. The long-term (up to 20 years) set-aside of agricultural land for environmental purposes, e.g., conservation reserves, biotopes and small national parks.
6. The education and training of farmers in environmentally-friendly production methods.

The *final agreement* included provision for the compensation of measures for water protection, organic farming, reconversion of arable land to extensive pasture, and extensification by increasing the area devoted to existing herds.

Here also Member States will implement the scheme by means of multi-annual zonal 5 year programmes reflecting similar situations as that for the afforestation scheme but also taking account of the main types of farming.

Aid will be provided on an annual basis per hectare or per livestock unit reduced, to farmers who undertake the actions referred to in (1) to (4) above for a period of at least 5 years and in the case of set-aside for 20 years.

Early Retirement of Farmers (Regulation (EEC) No. 2079/92)

The early retirement scheme is directed towards rationalisation of agricultural structures or easing the pressure on agricultural markets while ensuring that where the land is used for non-agricultural purposes it is compatible with the environment. It replaces the present scheme so as to provide a more effective instrument for improving the viability of

holdings and providing social assistance for older farmers. It is important to stress however that the scheme is to be optional at the level of Member States, but the level of EAGGF financing will be 75 per cent in Objective 1 regions.

The new scheme will apply to farmers aged 55 years or more and also to other persons employed on the holdings concerned. It will consist of an aid system with a maximum amount per holding and take the following forms:

- annual compensation independent of the area of the land released,
- an annual allowance per hectare of land released,
- a retirement pension supplement where the amount paid under the national retirement scheme is too low to encourage farmers to cease farming.

These amounts may be combined and paid in annual amounts.

Where the land is not used for agricultural purposes the transferee must undertake to use the land in a manner compatible with protection of the environment and preservation of the countryside. This land would of course also be available for afforestation as well as for non-agricultural purposes, or ecological reserves if taken over by any person or body other than a farmer. Aid for these purposes would be available under the respective agri-environmental and afforestation programmes.

As indicated earlier, this measure is optional, and given the condition that where the land is to be used for restructuring it must contribute to enlarging the holding size of the recipient, then its application in Ireland may be quite limited. By the same token, it may not be an issue of any significance in the context of afforestation.

In summary, these accompanying measures, particularly the agri-environment and farm retirement measures may not have much impact on the pace of or prospects for afforestation in the medium term in Ireland. The former, when adopted, could restrict the transfer of land to forestry, while the latter could increase the supply of land coming on the market.

The Farm Retirement Scheme is being implemented in Ireland and may be in operation by late Summer. The proposal submitted to the EC Commission provides for a rate of pension comprising a basic annual amount of £3,515 plus an annual allowance of £219 per hectare subject to an overall maximum annual pension of £8,711. The maximum farm area which qualifies is 24 hectares and the retiring farmer must be farming not less than 5 hectares of land.