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# The economic impact of the forestry and wood products sectors in Ireland

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## Key findings

- In 2003, direct output in the forestry sector was €255.4 million. Of this €134.4 million represented gross value-added (GVA) which was 0.12% of Gross National Product (GNP).
- For every one million euro in expenditure in the forestry sector a further €850,000 in expenditure was generated in the rest of the economy.
- The Type 2 employment multiplier for forestry was 1.90, thus for every 100 jobs in the forestry sector an extra 90 full-time equivalent jobs were provided in other sectors of the economy.
- When the indirect and induced effects were taken into account using the multipliers, the total value of forestry to the Irish economy was €472.45 million in 2003.
- Direct employment in forestry was 3,780. Accounting for the induced and indirect effects, the total employment supported by the forestry sector was estimated to be 7,182.
- Direct output in the wood products sector (i.e. panel board mills, sawmills and other wood products sector excluding furniture) was €975.0 million. Of this €312.3 million was gross value-added (GVA), representing 0.27% of GNP.
- Output and employment multipliers for the wood products sub-sectors were somewhat lower than for the forestry sector. The output multipliers for the panel board mills, sawmills and other wood products sector were 1.61, 1.71 and 1.72 respectively, while the employment multipliers were 1.68, 1.74 and 1.81 respectively.
- Direct employment in the wood products sector was 6,870. When the indirect and induced employment impacts were derived using the employment multipliers, the wood products sector supported a total of 12,246 jobs. This was 70% more than the total employment attributable to the forestry sector alone.
- The total value to the economy of the three wood products sub-sectors (i.e. panel board mills, sawmills and other wood products sector excluding furniture) was €1.65 billion, nearly 3.5 times the forestry sector figure of €472.45 million.

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## Introduction

The Government and the EU have invested a considerable amount of funds in the afforestation programme, and a number of assessments of the economic contribution of this investment have been undertaken. For example, Clinch (1999) concluded that the expansion of the forest estate as outlined in the forestry strategy (DAFF 1996) would provide a rate of return of approximately 4%, 1% below the Government's test rate. More recently, Bacon and Associates (2004) undertook an extensive review and appraisal of the forestry strategy. They reiterated that the target of 20,000 ha per annum was the most 'appropriate minimum target to secure a sustainable commercial processing sector'.

Both studies, however, used cost-benefit analysis, which does not allow the backward and forward linkages that connect the forestry sector to other sectors of the economy to be assessed.

In this context a study was initiated in 2003 to capture these linkages and quantify the economic contribution of forestry in Ireland. Specifically the objective was to evaluate the direct, indirect, and induced economic contributions of the forestry sector and the wood products sector to the national economy.

## Methods

The technique used to assess the economic impacts of the forestry and wood products sectors was input-output analysis. This allowed the linkages between forestry (i.e. growing sector) and the wood products sectors (i.e. processing sector) and other sectors in the economy to be determined.

An input-output model is based on the use of data organised in the form of a table which provides a picture of the structure of an economy at a given point in time and describes the various flows, represented as monetary values, of inputs to the productive process and matches these with outputs. Thus, an input-output model is one in which inter-industry linkages are explicitly specified. Central to the use of input-output models is the assumption that the use of inputs is in fixed proportion to total output. Any increase in total output leads to a specific increase in each input category, which is used in the production of that output.

Input-output analysis uses the techniques of matrix algebra to predict changes in output, employment and income in any sector as a result of changes in final demand (Miller and Blair 1985).

The most recently published input-output table for Ireland, which related to the year 1998, was used in this study (CSO 2004). In the table, forestry was grouped with agriculture and fisheries. Using information supplied by researchers at Trinity College (O'Toole and Matthews 2000), data obtained from the Central Statistics Office and surveys carried out by the project team (see below), the sector was divided into its component parts (i.e. forestry, agriculture and fisheries). The initial disaggregation of the agriculture, fishing and forestry sector was done by O'Toole and Matthews (2000) using their totals for intermediate demand and supply; the inter-industry distribution was allocated using survey data. The following ways in which forestry contributes to the economy of the Republic of Ireland were assessed:

- i) *The direct contribution of forestry:* The direct contribution is the impact of the spending by the forestry sector on goods and services.
- ii) *The indirect contribution of forestry:* The indirect contribution of forestry is that which occurs when suppliers to forestry firms purchase goods and services to meet demand.
- iii) *The induced contribution of forestry:* The induced contribution of forestry refers to the additional consumer expenditure that takes place when the wages and salaries generated from the direct and indirect contributions of forestry are in turn spent.

The sum of the *direct*, *indirect* and *induced* contributions, described above, represents the total contribution of forestry in terms of income and employment. Once the absolute contributions are estimated the Type 1 and 2 multipliers are obtained. These multipliers give the ratio of *direct* plus *indirect* contributions and of *direct* plus *indirect* plus *induced* contributions to the *direct* contribution respectively.

The 1998 input-output table has wood and wood products (excluding furniture) (hereafter referred to the wood products sector) as the main downstream sector using forestry output. This study sub-divided this sector into three sub-sectors, namely panel boards, sawmills, and other wood

products excluding furniture (hereafter this will be referred to as other wood products). This sub-division was carried out using information from the Bacon and Associates report (2003), survey data (see below) and the 1998 input-output table (CSO 2004).

Firms involved in the forestry and wood products sectors were surveyed to obtain data on employment, purchases and output. A questionnaire was devised and sent to 32 firms in June 2004. These firms included the four panel board mills in the Republic of Ireland, Coillte Teoranta, as well as the major Irish forest management and harvesting companies. In addition, all the sawmills that were members of the Irish Timber Council were surveyed. These sawmills processed 95% of the timber produced in Ireland in 2004. The aim of this survey was to gather data that could be used to divide the forestry sector into its component parts (i.e. forestry, agriculture and fisheries) and the wood products sector into sub-sectors (i.e. panel boards, sawmills, and other wood products). Twenty-one completed questionnaires were returned representing a response rate of 65% and accounted for over 90% of employment and output in both the forestry and wood products sectors.

## Results

Direct expenditure by the forestry sector in the year 2003 was €255.4 million. The sector has strong linkages to the domestic economy (Table 1) with domestic inputs

accounting for over 74.1% of all expenditure. Gross value added in the forestry sector was €134.5 million. Profits accounted for 28.3% of expenditure. Wages and salaries made up 20.9% of expenditure. Other domestic inputs (consumption of fixed capital, and taxes and subsidies on production) were 3.4% of total. Total direct employment was estimated to be 3,780. Thus, employment in the forestry sector was equivalent to 28.1 full-time equivalents (FTEs) per million euro gross value added. This compares to 57 FTEs per million gross value added for the economy as a whole, reflecting the capital intensive nature of forestry compared to other sectors of the economy, especially the service sectors. Forestry has lower levels of imports than the national average which impacts on the eventual multiplier analysis.

The Type 1 output multiplier was 1.25 (Table 2) indicating that for every one million euro of output in the forestry sector an extra €250,000 was generated in the wider economy as suppliers to the forestry sector purchased goods and services to meet demand. When the induced impact was accounted for, each one million euro in output in the forestry sector generated €850,000 in output in the rest of the economy (i.e. Type 2 output multiplier of 1.85). The Type 2 employment multiplier was 1.90. For every 100 jobs in the forestry sector an extra 90 FTEs were provided in other sectors of the economy. The total value generated by forestry activity to the Irish economy was €472.4 million. The total employment related to forestry sector activities was 7,182 FTEs.

Table 1: Forestry and wood products sectors - direct expenditure (€ million – 2003) and employment full-time equivalents (FTEs).

	Forestry sector		Wood Products Sector							
			Panel board sub-sector		Sawmill sub-sector		Other wood products sub-sector		Total wood products sector	
	Expenditure	% of total spend	Expenditure	% of total spend	Expenditure	% of total spend	Expenditure	% of total spend	Expenditure	% of total spend
Total Domestic Intermediate Inputs	54.7	21.4	60.9	34.8	128.7	40.2	196.9	41.0	386.9	39.6
Wages and Salaries	53.4	20.9	30.0	17.1	49.0	15.3	97.0	20.7	176.0	18.0
Profits	72.3	28.3	28.8	16.5	60.3	18.8	41.5	8.7	130.6	13.4
Net Other Domestic Inputs	8.8	3.4	3.9	2.2	14.0	4.4	16.6	3.5	34.5	3.5
Total Domestic Inputs	189.2	74.1	123.6	70.6	252.0	78.7	352.5	73.4	728.1	74.5
Imports	66.2	25.9	51.4	29.4	68.3	21.3	127.2	26.6	246.9	25.5
Total Inputs	255.4	100.0	175.0	100.0	320.3	100.0	479.7	100.0	975.0	100
Employment	3,780 <sup>1</sup>		705		1,607		4,558		6,870	

<sup>1</sup> Phillips, cited in Bacon and Associates 2004.

## Contribution of the wood products sector to the national economy

Direct output in the wood products sector was €975.0 million (CSO 2005). Direct employment in this sector was 6,870 (Table 1). Imports account for 25.5% of total spend. This was a relatively low import content compared to other sectors of the Irish economy. Profits were lower in the wood products sector than in the forestry sector.

The other wood products sub-sector accounts for 66.3% of the employment within the wood products sector. The panel board sub-sector has the smallest level of employment 705 (10.3%). In contrast, this sub-sector has the highest per capita wage of €42,553. The lowest import levels were in the sawmill sub-sector (i.e. 21.3%).

Multipliers were derived for the three wood products sub-sectors (Table 2). There was little difference in the size of these multipliers with the other wood products sub-sector having the highest Type 2 employment multiplier. Using these multipliers the total impact in the economy as a result of expenditure in the wood products sector in 2003 was estimated to be €1.6 billion. This activity generated a total employment of 12,246 which was 70% more than the total employment attributable to the forestry sector alone. Impact estimates cannot be aggregated directly with the data presented in Table 2 due to an overlap in indirect and induced impacts.

## References

- Bacon, P. and Associates. 2003. *Forestry: a growth industry in Ireland*. [http://www.coillte.ie/fileadmin/templates/pdfs/Bacon\\_Report.pdf](http://www.coillte.ie/fileadmin/templates/pdfs/Bacon_Report.pdf). [Accessed 21st December 2007].
- Bacon, P. and Associates. 2004. *A review and appraisal of Ireland's forestry development strategy, final report*. Stationery Office, Dublin.
- CSO (Central Statistics Office). 2004. *Input-output table 1998*. Stationery Office, Dublin.
- CSO (Central Statistics Office). 2005. *Census of industrial production 2003*. Stationery Office, Dublin.
- Clinch, P. 1999. *Economics of Irish forestry*. COFORD. Dublin, Ireland.
- DAFF (Department of Agriculture, Food and Forestry). 1996. *Growing for the Future. A strategic plan for the development of the forestry sector in Ireland*. Stationery Office, Dublin.
- Miller, R. and Blair, P. 1985. *Input-Output Analysis: Foundations and Extensions*. Prentice-Hall, Englewood Cliffs, New Jersey.
- O'Toole, R. and Matthews, A. 2000. *Linkage effects of the Irish Agro-Food Sector*. FAPRI Ireland Working Paper Series No. 9, Teagasc, Ireland.

Table 2: Forestry and the wood products sub-sectors - output and employment – (€ millions – 2003).

	Output					Employment					
	Direct	Indirect	Induced	Type 1	Type 2	Direct	Indirect	Induced	Type 1	Type 2	
<b>Forestry</b>											
€ millions	255.4	63.8	153.2	319.2	472.4	FTEs	3,780	869	2,533	4,649	7,182
Multipliers	1.00	0.25	0.60	1.25	1.85	Multipliers	1.00	0.23	0.67	1.23	1.90
<b>Panel boards</b>											
€ millions	175.0	43.8	63.0	218.8	281.8	FTEs	705	162	317	867	1,184
Multipliers	1.00	0.25	0.36	1.25	1.61	Multipliers	1.00	0.23	0.45	1.23	1.68
<b>Sawmills</b>											
€ millions	320.3	99.3	128.1	419.6	547.7	FTEs	1,607	514	691	2,121	2,812
Multipliers	1.00	0.31	0.40	1.31	1.71	Multipliers	1.00	0.32	0.43	1.32	1.74
<b>Other Wood Products</b>											
€ millions	479.7	95.9	249.4	575.6	825.0	FTEs	4,558	957	2,735	5,515	8,250
Multipliers	1.00	0.20	0.52	1.20	1.72	Multipliers	1.00	0.21	0.60	1.21	1.81

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