Tree Farming in Ireland: Potential and Prospects

FRANK J. CONVERY

School of Forestry and Environmental Studies,
Duke University, Durham, NC 27706.[1]

The potential for using the drumlin soils in Ireland for commercial tree growing has been a recurring theme in Irish forestry circles for more than a decade. There are a number of reasons for this interest. These soils are remarkably productive for tree growth, and productivity estimates, based on actual per acre output from both state and private forests, are now available.

A. O'Rahilly and Robert Tottenham, who have tree farms in County Leitrim and County Clare respectively, have been enthusiastic and articulate supporters of forestry on those lands, and their views have been orchestrated to some extent by Professor T. Clear of University College, Dublin. The Agricultural Institute, in its resource survey of Co. Leitrim, concluded that much of the drumlin area could be afforested to the national advantage. An estimate of Leitrim's soil productivity for tree growth was prepared as part of this survey. The key reason why the tree farming issue continues to be raised is the dismal net revenue generating performance of conventional farming on these soils. Even the high output prices paid since Ireland joined the EEC have signally failed to improve the situation, nor have a variety of government supported drainage schemes and input subsidy programmes. While some of these sites can support highly profitable agriculture, sophisticated and sustained farm management is required.

Recently the author analysed a number of Irish forestry policy issues at the request of the National Economic and Social Council (NESC) (Convery, 1979). Among the topics which I examined was the economic potential for tree farming on drumlin soils.

1 Present address: The Economic and Social Research Institute, 4 Burlington Road, Dublin 4.

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RESULTS OF THE NESC STUDY

Returns to Tree Farming

An excellent analysis of the returns to tree farming was undertaken by T. Rea (Forest and Wildlife Service) on behalf of a joint North Connacht Farmers Cooperative Society (NCF) — Forest and Wildlife Service (FWS) committee. Six farms in County Leitrim were selected for the analysis. These were assigned to yield classes by acquisition inspectors, and then work-study inspectors of the Forest and Wildlife Service estimated the current (1977) costs of crop establishment and management; revenues were estimated using 1977 prices. The outputs were reduced by 15% to account for anticipated losses due to windblows, frost, fire, insect and disease attack etc. The results are summarised in Table 1. If the real (i.e. net of inflation) interest rate is 4 per cent, then an investor could afford to borrow money at this rate and from the harvest proceeds pay all of the outgoings for tree crop establishment and management, pay back the loan (including accrued interest) to the bank and pay the landowner between £45 and £37 per acre per year (depending on site class) in 1977 for the right to grow wood on this land. It is important to note that the payments to the landowner are expressed in 1977£; this means that if wood prices keep pace with inflation and the other assumptions hold, the investor can afford to index the payments to the landowner so that these amounts too keep pace with inflation. If money were borrowed at a real rate of interest of 7 per cent the amounts which could be paid to landowners drop sharply, falling in the £10 to £19 (1977) per acre range.

The total and per acre cash flows expected over time on a Yield Class 24 site of 24 acres are listed in Table 2.

Returns to Agriculture

The average returns per adjusted acre[1] on Group 2 soils (which includes the drumlin soils) for all uses and a few representative activities are listed in Table 3. These data are taken from the Farm Management Survey of An Foras Taluntais. Family farm income is defined as gross output less operating expenses. It does not allow for the cost of family labour, management and most[2] capital invested in the farm business. Management and investment income is defined as the income remaining after these 3 additional cost items have been deducted. It is exactly equivalent to the annual allowable payments estimated earlier for tree farming. Except for dairy farming in 1977, all of the net returns per adjusted acre are negative; this contrasts with the returns to tree farming, which range from £45 to £10, depending on the interest rate used and the

Table 1 Present Worth, Annual Equivalent and Internal Rates of Return, Co. Leitrim, Case Study Areas, 1977.

				Present Worth per Acre (£)						Net Annual Equivalent per Acre		Internal Rate of Return (%)
				Revenue		Costs		Net Worth				
Site No.	Area (Acres)	Yield Class	Rotation Age	4%	7%	4%	7%	4%	7%	4%	7%	
1	80.5	22	40	1,033	384	296	245	737	139	37	10	9
2	27	22	40	1,033	384	253	207	780	177	39	13	9.5
3	16.35	24	35	1,076	441	260	217	816	224	44	17	10
4	24	24	35	1,076	441	241	200	835	241	45	19	10.5
5	23	24	35	1,076	441	241	201	835	240	45	19	10.5
6	22	24	35	1,076	441	254	211	822	230	44	18	10.5

Source: Forest and Wildlife Service.

Table 2 Revenues and Costs, Total and per Acre, Site No. 4, Yield Class 24, 1977 Prices (£), Area 24 acres.

	Total (£)			Per Acre (£)		
Year	Revenues	Costs	Cash Flow	Revenues	Costs	Cash Flow
0		3,000	–3,000		125	–125
1		64	–64		3	–3
2		131	–131		5	–5
3-7		64	–64		3	–3
8		171	–171		7	–7
9		64	–64		3	–3
10		144	–144		6	–6
11-12		64	–64		3	–3
13		265	–265		11	–11
14		502	–502		21	–21
15	1,791	514	1,277	75	21	54
16		136	–136		6	–6
17-18		64	–64		3	–3
19		96	–96		4	–4
20	4,071	637	3,434	170	27	143
21		136	–136		6	–6
22-23		64	–64		3	–3
24		154	–154		6	–6
25	5,597	491	5,106	233	20	213
26		136	–136		6	–6
27-28		64	–64		3	–3
29		96	–96		4	–4
30	8,228	406	7,822	343	17	326
31-33		64	–64		3	–3
34		96	–96		4	–4
35	72,351	364	71,987	3,015	15	3,000
Total	92,038	8,633	83,405		360	3,475

Note: Numbers may not sum to totals shown because of variance due to rounding.
Source: Forest and Wildlife Service.

productivity of the site. Since the returns to agriculture are averages, actual returns are distributed equally above and below these estimates. It is clear that if the return to resources invested is used as the criterion for allocating land, then it would be advantageous to grow trees on some of the land now being farmed. With regard to employment, it is difficult to compare the impacts of the alternative land uses directly, because of the time dimension in forestry operations. In general however, it can be said that tree farming will provide less employment than agriculture on the land suring the tree growing phase, but much more total employment later on when the wood is processed. The impacts on the physical and visual environment of a change from agriculture to forestry[3] are not likely to be adverse, and may be mildly beneficial. The effects of such a change on the balance of payments and regional development will be positive. Therefore I conclude that it is in the national interest to encourage tree farming on drumlin soils.

Table 3 Average per Acre Returns to Agriculture on Drumlin Soils.

	Average per Adjusted Acre			
	Family Farm Income (£)		Management and Investment Income (£)	
	1976	1977	1976	1977
Soil Group 2 (includes drumlin soils)	58.3	37.5	–19.7	–24.4
Mainly Drystock	50.2	37.5	–19.7	-24.4
Hill Sheep and Cattle	34.7	31.8	–53.6	–71.5
Mainly Creamery Milk	74.6	77.3	–12.2	7.8

ISSUES IN IMPLEMENTATION

If the returns to investment on drumlin soils so favour tree farming, will not normal market incentives result in the most efficient land-use mix? To some extent, these forces are already working; there is increasing interest by entrepreneurs, banks and land-owners in tree farming. However, the socio-economic characteristics of the predominant proportion of the land-owning population are such that market forces alone are unlikely to be sufficient to achieve the appropriate level of investment. Even a real rate of return of 30 per cent per annum is unlikely to be of much interest to many 70 year old landowners if they have to wait 35 years before the return on their investment is realised. Likewise the capital market is imperfect; lenders are not used to dealing with the planning horizons involved in forestry finance, and lack the technical expertise to evaluate loan applications. Markets in immature plantations have yet to develop.

Even if market forces could be depended on to achieve the requisite change in land-use, they might not necessarily do so in a manner most consistent with the national interest. To illustrate: much of the very extensive private tree planting which took place in recent years in Scotland was stimulated by the ability of investors to expense most of their outlays on forestry. This means that they could offset therse expenditures against current income in deriving taxable income. Thus, if their income tax rate at the margin is 60 per cent, an investment of £10,000 will only cost the investor £4,000. If such a provision were to be made available to Irish taxpayers, we could see considerable investment by those with high marginal income tax rates in the purchase and planting of drumlin lands. While this provision would effect the land-use transfer from agriculture to tree farming, I'm not sure that it is a model we would want to emulate; the land and trees would propably be owned for the most part by relatively rich residents of Dublin, while the local residents would be left in the role of overseers and caretakers. A few alternative approaches are outlined below.

IMPLEMENTATION

In order to allay the suspicions and fears of the people in drumlin areas, it should be made absolutely clear that only landowners wishing to participate in tree farming need do so; no compulsion will be involved. A modest total area goal for tree farming should be established, e.g. 20% of the total drumlin area, about 500,000 acres. This would help allay fears that the area was going to be totally covered with trees. The programmes would be targetted at two categories of owners: (a) Those who wish to afforest some of their own land, and harvest the proceeds. This type of tree farming

should be attractive to young (25-35 year old) farmers who have sufficient land that they could allocate some of it to a use yielding no immediate return. Pig farmers might fall into this category. Landowners whose main occupation is not farming might also be attracted to tree farming; approximately one-third of Irish landholders classify themselves for census purposes as having occupations other than farming, and this category of landowner is growing rapidly. (b) Those who wish to rent their land for tree farming. This choice might be attractive to the owner types discussed in (a) above, but it might have particular appeal to older landowners.

An intensification and extension of current landowner assistance efforts would be sufficient to service the needs of those who wished to tree farm on their own land. However, to institute a tree-farm rental programme would require involvement in a financial "bridging" programme; at present, almost regardless of the attractiveness of the rate of return, financial institutions are not geared to handle the 15-20 years during which the rental would have to be paid without an significant revenue accruing. There are various possible mechanisms for doing this — using a European Investment Bank loan or government funds to finance the early payments, for example — but these need to be systematically explored and then acted upon.

Implementation of the EEC supported so called "Gundelach Plan", which will give up £400 million for infrastructure development of agriculture in the West of Ireland, provides a wonderful opportunity for tree farming and the forestry profession to make a substantial contribution to the welfare of the western community. What is required is full blooded commitment to the realisation of their opportunity. Who is going to take the leadership role in insuring that tree farming is given the resources and priority in this development effort? In Table 4 the annual rentals required to finance a tree farming programme of 10,000 acres per annum at £40 per acre for 15 years are listed. After 15 years, revenues would begin to be generated, and in any event "normal" financing would pay a predominant financing role thereafter. How would implementation best be handled? The agricultural advisory service is being reorganised, and is now in a state of organisational flux. This might be an appropriate time to introduce a number of tree-farming advisors into the service, backed up by a research programme at An Foras Taluntais. Another approach would be for the Forest and Wildlife Service to build on the services it already provides. What roles might the Society of Irish Foresters, and the forestry and related professions, play?

I believe that our profession now has an opportunity to contribute significantly to the re-vitalisation of the West; it remains to be

seen whether we embrace this opportunity, with its attendant risks and difficulties, or opt instead for the less troublesome but less rewarding role of "business as usual".

Table 4 Annual Rental Payments Required to Finance a Tree Farming Programme of 10,000 Acres per Annum with an Average Rent of £40 per Acre (1977).

Year	Total Acreage Planted (Acres)	Rental Paid (1977£)
0		
1	10,000	400,000
2	20,000	800,000
3	30,000	1.200,000
4	40,000	1,600,000
5	50,000	2,000,000
6	60,000	2.400,000
7	70,000	2,800,000
8	80,000	3,200,000
9	90,000	3,600,000
10	100,000	4,000,000
11	110,000	4,400,000
12	120,000	4,800,000
13	130,000	5,200,000
14	140,000	5,600,000
15	150,000	6,000,000

FOOTNOTES

1 An "adjusted" acre is the designation used by the Agricultural Institute to signify land area net of roads, buildings etc., i.e. it represents the "effective" land area.
2 Allowance is made for payment of interest and principal on currently outstanding loans.
3 On the scale I outline below, which would involve the conversion to forestry of 20 per cent of the 1 million hectares of drumlin and related soils.

REFERENCE

Convery, Frank J., "Irish Forestry Policy" Part II of *Report No. 46*, National Economic and Social Council, Dublin, 1979.