A Study of the County Clare Farm Forestry Market

Summary Report

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In Association With:
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Newmarket-on-Fergus
Labasheeda
Money Point
Scattery Island

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FOREWORD

The history of Rural Resource Development 's involvement in forestry goes back to 1998 when we published our first forestry study 'Forestry and Local Development: An Action Plan for East Clare '. Arising from this study, the potential for a major forestry project in East Clare was identified and the second RRD forestry study was born. The publication of this LEADER funded study 'Proposal for the Establishment of a Forestry Development Centre in East Clare' five years ago in November 1999 was followed by a campaign of intense lobbying to secure government funding to set up the Centre, but it was not to be. However, as part of this campaign, a joint RRD-Forest Service Farm Forestry conference was held in the village of Mountshannon in East Clare to discuss the future of the industry. It was at this event that the issue of first thinnings came to our attention and it was the local forestry growers who voiced concern at the market outlook for first thinnings. Where, they asked, could they sell this forest crop, was it economically viable to thin and how were they going to develop the forest management skills needed for the first thinnings process?

With those seeds of concern planted, Teagasc personnel approached RRD in 2003 to propose a further LEADER funded study, this time to look specifically at the first thinnings market for farm forestry in County Clare. Through discussions with interested parties, it became clear that this was a study that was both innovative and timely, not just for Co. Clare's forestry growers but equally for the many other Western Package farmers of the 1980s who had pioneered farm forestry in the days before lucrative EU premia and who now faced an uphill struggle to reap the rewards of their investment at first thinnings stage.

To the study Steering Group members I would like to express my sincere thanks for their time, commitment and expertise. Their efforts over the past year have ensured that this study is equally relevant to farmers and policy makers. We also wish to thank the study consultants, Paddy Purser and Mark Tarleton, for their professionalism, hard work and co-operation.

For RRD and the Steering Group members, undertaking this study has been a means to an end, not an end in itself. We sincerely hope that the study findings and recommendations will land on fertile ground, and it is our firm intention to pursue this objective over the coming months. For the farmers who have shown faith in forestry, we hope that this study will give you encouragement and some practical direction for the future.

Fr Harry Bohan
Chairman
Rural Resource Development

1 Executive Summary

The rise in private sector forest establishment in Co. Clare during the 1980's and 1990's is now resulting in the commencement of timber production from these plantations. There will be a steady stream of production of small diameter logs from farmer owned forests which will critically test market conditions up until c. 2013, at which stage there will be a dramatic increase in production. However, production from farmer plantations will still be relatively insignificant at this stage compared to forecast production figures from non-farmer forests (principally Coillte). The expected value of farmer produced timber in Co. Clare will be approximately €600,000 per annum by 2020. The situation in Co. Clare is closely mirrored in many other Irish counties that have experienced rapid afforestation rates in the past two decades.

This represents a new challenge for farming communities and for other professionals in Co. Clare and it will be necessary to prepare thoroughly for this rise in production through the improvement of technical skills, local and regional infrastructure and management systems. The successful early adoption of best forest practice and new viable markets will be critical in paving the way for subsequent industry development. Unfortunately, the absence of a detailed spatial forest inventory is a constraint on good planning and infrastructural development.

Conventional markets will only partially cater for the expected rise in timber production. However, harvesting and transport costs mean that low value small diameter logs will, in general terms, not generate short term financial returns for private forest owners. The development of new local markets for small diameter logs requiring significantly less timber transportation is therefore seen as a priority in the county. It is likely that heat and energy markets utilising wood as a renewable fuel will develop. This should be seen as an opportunity within the county and strong efforts are now required to establish good case studies which are replicable in Clare and elsewhere.

The overall aim of the study has been to assist Co. Clare farmers to realise the value of their farm forestry resource by assessing the market supply and demand conditions, and by identifying the actions required to support the development of the farm forestry first thinnings market.

This study has been funded by Rural Resource Development Ltd, the organisation which operates the LEADER programme in Co. Clare. The project has been managed by a steering committee chaired by Teagasc on which a number of organisations / groups have been represented, namely Teagasc, The Forest Service, Coillte, The Irish Farmers Association, The Irish Forestry Contractors Association, Private forestry growers, Finsa Forest Products Ltd. and Rural Resource Development Ltd.

2 The Forest Resource

As part of the first phase of a National Inventory of Irish Forests in 1998, the Forest Service identified and broadly classified forest areas in Ireland. The results for Co. Clare showed that of the approximately 45,000 hectares of woodland in the county, ownership was evenly split between the state and private sectors. The overall figure in 1998 represented 14.2% of the county making it the fourth most afforested county in Ireland in percentage terms. Figure 1 presents a summary of planting statistics for Co. Clare from 1982 to 2002 for both the private and public sectors. During this period, Sitka spruce (Picea sitchensis (Bong.) Carr.) was the predominant tree species planted by farmers in the county. Figure 1 illustrates the surge in private planting and the reduction in public planting that has occurred in the county over this period. For the eleven year period from 1991 to 2001 (inclusive) the average plantation size for private plantations was 9.17 ha.[1]

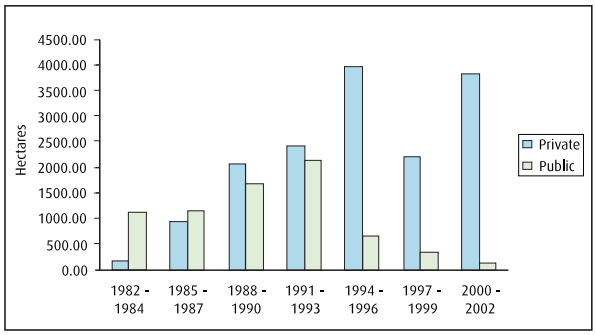

Figure 1: Area Afforested in Co. Clare (1982 – 2002) by both Public and Private Sectors

3 Timber Production Forecast

3.1 Private Owners

A stratified and representative sample of 44 farmer[2] owned forests planted between 1981 and 1993 were surveyed. Based on this survey a production forecast for farmer owned sites was generated using the following criteria:

- A Yield Class was assigned to each site based on Top Height & Age.
- Forestry Commission Intermediate Thinning Models for 2m spaced Sitka spruce were used.
- Thinning yields were estimated as 70% of Yield Class on a five year thinning cycle (for thinable sites) with the year of first thinning estimated during the field survey visit.
- The production forecast was made up until 2021.
- For each harvest, a breakdown of pulp wood, pallet and sawlog was forecast based on Forestry Commission assortment tables.
- Pulp wood was further categorised into stake wood (50%) and pulp / firewood (50%).

A production forecast for farmer owned sites planted between 1994 and 2002 was produced and added to this. The production forecast for these more recently planted sites was produced as follows:

- An average Yield Class of 18 was applied based on the results of the ground survey.
- Areas of broadleaves were removed from the forecast.
- An average productive area of 73.6% was applied based on the results of the ground survey.

[1] Source: Forest Service website: http://www.agriculture.gov.ie/index.jsp?file=forestry/pages/fips.xml

[2] For the purpose of this study, farmer owned forests are defined as those owned by full and part time farmers and also those that are owned by individuals who may be retired or working in another profession.

- Forestry Commission Intermediate Thinning Models for 2m spaced Sitka spruce were used. Therefore, assuming YC 18, thinning volumes commence at age 21 and are forecast as 63m^3 per hectare every 5 years.
- The production forecast was made up until 2021.
- For each harvest, a breakdown of pulp wood, pallet and sawlog was forecast based on Forestry Commission assortment tables.
- Pulp wood was further categorised into stake wood (50%) and pulp / firewood (50%).

The combined production forecast for farmer owned forestry in Co. Clare is presented in Figure 2. This shows a dramatic increase in forecast production commencing in 2013. In the meantime there will be a steady stream of production which will critically test the market conditions in advance of the large increases from 2013 onwards. The dominance of pulp wood and stake wood in this production forecast is the other notable feature.

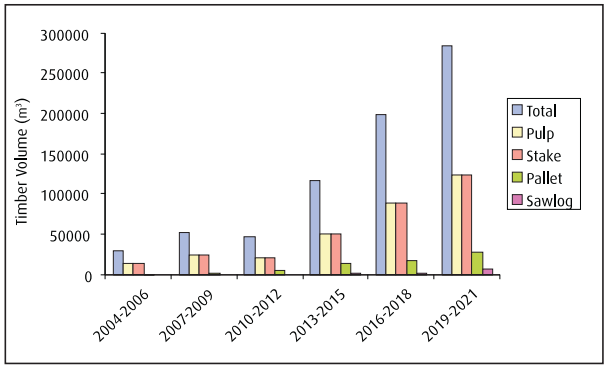

Figure 2: Potential Production in cubic meters (2004 – 2021) from Farmer Owned Forestry Planted Between 1981 & 2002

3.2 Non-Farmer

A summary of the production forecast for non-farmer plantations is presented in Figure 3. Production forecast data for the county was obtained from both Coillte and the Irish Forestry Unit Trust (IFORUT). This represents the vast majority of non-farmer forest ownership in Co. Clare that will be in production by 2021, the year to which this production forecast has been made. This shows a less dramatic increase in production than for farmer owned sites and a steady rise in the production of the more valuable sawlog timber assortment.

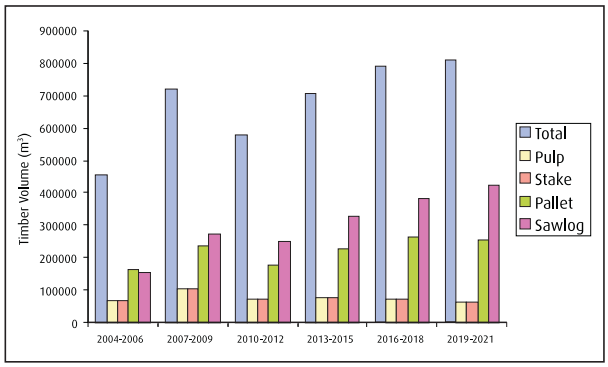

Figure 3: Potential Production in cubic meters (2004 – 2021) from Non-Farmer Owned Forestry

Figure 4 presents a comparison of farmer and non-farmer production forecasts for Co. Clare and clearly shows how production from non-farmer forests will continue to dominate the market for the foreseeable future.

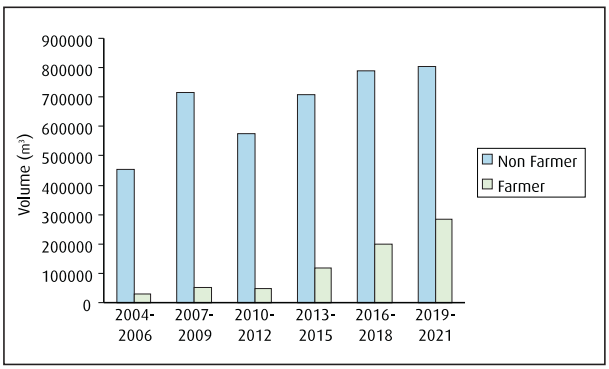

Figure 4: A Comparison of Farmer and Non-Farmer Production Forecasts for Co. Clare (2004 – 2021)

No production figures are presented in the above forecasts for any additional wood fuel assortment (timber less than 7cm in diameter, branches or dead trees). It is considered more appropriate that the pulp wood assortment (timber with a minimum top diameter of 7cm) should be reckonable as a wood fuel resource, competing with the conventional board mill end use market.

3.3 Forest Management Options

The timber production forecast has been based on the measurement and assessment of stands representatively sampled in the field survey. Sixty-nine per cent of stands were classified as fit for thinning while 31% were classified as unfit for thinning. Many of the sites deemed thinnable should be classified as sensitive to the timing of thinning. For example, a site that has been reported as thinnable may not be similarly classified at a later date when the window of opportunity for first thinning has passed. The timing of first thinning is critical in minimizing wind throw risk while maintaining the economic viability of the operation and the forestry enterprise as a whole. Those sites which were deemed fit for thinning were assigned a thinning production cycle based on current industry practice.

Another management option used by foresters on sites of intermediate windthrow risk is to carry out a single thinning and subsequently to grow the crop on to clearfell age with no further interventions. This option is used to allow the stand the benefit of thinning which is carried out at a time when trees are below the critical height[3] vis-à-vis windthrow. At a later stage, when trees are above this critical height, thinning is not carried out in order to minimise the windthrow risk.

On some sites, where timber quality is good and a high percentage of stake wood and pallet wood are achievable in the first thinning operation, the lower value pulp wood element is not extracted to the forest road side and is left lying in the wood. This system may be operated where there are strong local markets for stake wood and pallet wood and where the extraction of pulp wood will have a negative effect on the value of the other assortments.

[3] The Critical Height of a stand of trees is the top height at the onset of wind throw. Critical Height is a function of Climate, Elevation, Topography, Soil Conditions and Species.

Highly productive sites where timber production is in excess of published yield models are common in Co. Clare, particularly on wet mineral soils in areas of good shelter. On these sites, the silvicultural option of earlier and more frequent thinnings becomes possible. On these sites under such a regime, the production of more valuable sawlog commences at an earlier stage than on sites of lower productivity.

On those sites where thinning is not possible or creates too high a risk of wind throw, this fact should be accepted and the plantation should certainly not be considered a failure. Although interim revenues from thinnings are foregone and the value per cubic metre of final crop material is reduced, the stand does not stop growing due to lack of thinning and in most cases a valuable clearfell crop will still result.

4 The Current Operating Environment

4.1 Farmers

A forest owners survey was carried out in order to ascertain their background and forest management knowledge. In particular it was hoped to gain an understanding with regard to their intentions and enthusiasm vis-à-vis realising the productive potential of their forest crops through thinning / harvesting. Some of the key results of this survey are presented below.

- None of the sampled owners have a current management contract with a forestry company or consultant although 47% of owners said that they knew either a forester or a forestry contractor who might be able to assist them with arranging thinning and marketing of timber.
- 80% of owners had no knowledge of what was involved in selling timber and 64% had no knowledge of forest products and their relative values.
- 47% of owners have established at least one more forestry crop since their original planting project and have therefore increased their holding size.

Figure 5 presents an age profile of owners surveyed. This shows that 86% of growers are over the age of 45 and 39% are older than 60. It is clearly not young farmers who have made decisions to start forestry enterprises on their farms but older farmers who are unlikely to reap the full reward themselves from the sale of a final timber harvest at clearfell.

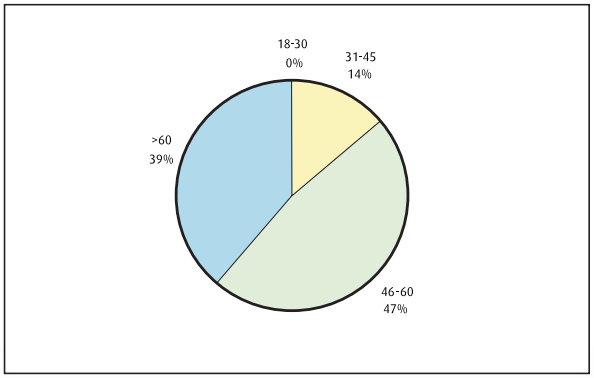

Figure 5: Age Profile of Farmer Growers in Co. Clare

Figure 6 presents the occupations of owners surveyed. Throughout this report owners are referred to as either "farmer" or "non-farmer". However, this is somewhat of a misnomer as "farmer" owners include all those represented in Figure 6 or in other words, individual private owners. Non-farmer owners, as referred to in this report include Coillte and institutional owners in the private sector such as pension funds.

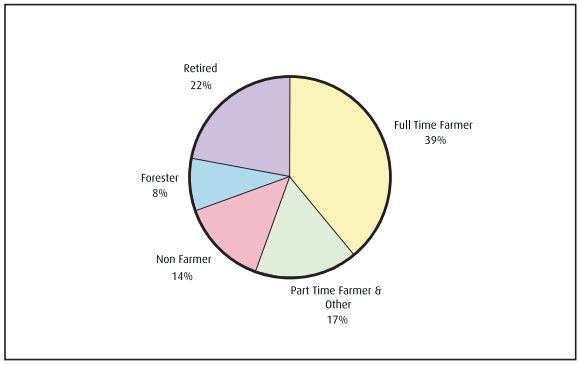

Figure 6: Occupation of Farmer Growers in Co. Clare

Figure 7 presents the intentions of farmer owners vis-à-vis their forestry crops. The majority of owners are aware that thinning will be required and plan to do this but do not know how to go about this or what the timber market is looking for.

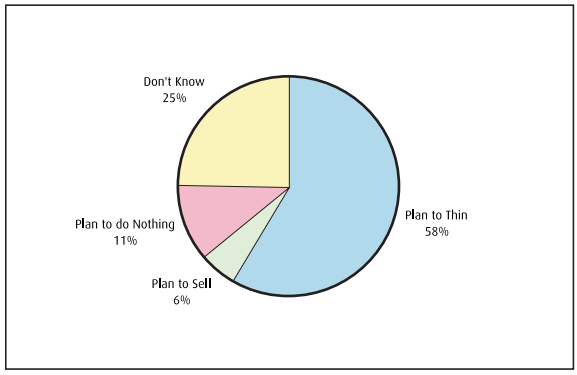

Figure 7: Forest Management Intentions of Farmer Growers in Co. Clare

4.2 Professional Foresters

There are 33 professional foresters providing services to the private sector with addresses in Counties Clare, Limerick, Tipperary and Galway. This does not include other foresters employed by Coillte, Teagasc or the Forest Service. A survey of these foresters was carried out and the results can be summarised as follows:

- 79% had experience in selling timber although only 21% had done so in Co. Clare.
- 86% of foresters expect that in 5 years time they will have sold timber in Co. Clare.
- 50% of foresters felt that they would like to receive more training in the area of timber harvesting and marketing.
- In general foresters were optimistic about the potential for timber sales and 71% felt they could ensure that first thinning would either break even or return a profit for the owner. This figure rose to 78% for second thinnings

and 86% for subsequent thinnings and clearfells.
- On the question of how they would present timber for sale there was a 50:50 split between the options of standing or roadside sales.
- 10 ha. was the minimum harvest area considered by foresters to be commercially viable for 1st thinning[4] This area reduces with each subsequent harvest.
- 36% of foresters said that they were planning to operate a co-operative or grouped sales system, and had the client base within the county to achieve this.

Foresters were asked to comment on what they considered to be the main constraints to the successful marketing of farmer owned timber in Co. Clare. The nature of the responses is summarised in Table 1. These issues are discussed in Section 7 in the context of the overall study and recommendations are presented where relevant.

Issue	% Identified
Location & Access	100
Forestry Knowledge	79
Plantation Size	64
Markets	57
Industry Leadership	57
Contracting Resource	21
Timber Quality	21

Table 1: Professional Foresters' Perceptions of Constraints to Successful Harvesting & Marketing of Timber in Co. Clare

4.3 Existing National Markets

Irish timber is currently cut in the wood into four major product categories or assortments. The specification, indicative current values and end uses for these are summarised in Table 2 below. This timber is on the whole purchased by large timber processing companies such as sawmills, stake mills and board mills. Apart from the larger timber processors there are many other smaller sawmillers, particularly in the large sawlog, stake wood and pulp wood (firewood) sectors who consume small quantities of round logs on an irregular basis. These small players can be important at a local level e.g. within and near to Co. Clare.

Residues in the form of wood chips, sawdust and bark (sawmilling bi-products) are important commodities used in the manufacture of board material and their availability on the market greatly affects the demand for pulp wood in the form of round logs directly from the forest.

The production forecast presented in Section 3 clearly demonstrates that the main products that farmers will be bringing to the market in the short and medium term will be the products from thinnings, namely pulp wood, stake wood and pallet wood. Of these, pulp wood and stake wood are the dominant products. If crops are to be thinned and farmers are to realise the full potential value of forestry in the future then it is essential that medium and long term strategies are developed to secure markets for these interim products. The current and future markets for these products are discussed in Sections 4.4 and 4.5 below.

4.4 Pulp Wood Market Dynamics

The current demand for raw material at the board mills in the Republic of Ireland is approximately 1.6 million m^3 per annum[5]. About half of this demand is currently met by residues (chip and sawdust) supplied by the sawmilling sector. The other half is taken in directly from the forest as round log in the form of pulp wood. The potential production of pulp wood in Irish forests is set to increase by 81% over 2001 levels by 2015 and all of this increased production is expected to come from the private sector (Gallagher & O'Carroll, 2001). The forecast for Co. Clare closely reflects these national figures. There is a growing trend for sawmills to retain residues for use on their own premises for Heat, Combined Heat and Power, and Fuel Pellet production. This has started to and will continue to reduce the amount of residues available to the board mills. It is therefore expected that the board mills will increase their intake of pulp wood directly from forests. There is no evidence yet that this will have a positive effect on the price payable for pulp wood. Board mills operate in the global panel board market and are therefore exposed to external market forces which largely dictate the mill gate pulp wood price.

Finsa Forest Products in Scariff (East Clare) are a consumer of pulp wood and residues which they use to produce chipboard, predominantly for the Irish market but also for the UK and European markets. Their current intake is approximately 180,000 tonnes which is approximately made up of 80,000 tonnes of sawdust, 35,000 tonnes of recycled wood, 30,000 tonnes of white chip, 20,000 tonnes of lower grade chip and 5,000 tonnes of round pulp wood logs. Clearly, the percentage of their intake coming directly from the forest is very low and is equivalent to pulp wood from about 200 ha. / annum. Much of this requirement is filled from Coillte forest properties. However, it is likely that the pulp wood intake at Finsa will increase although a reduction in the supply of residues (particularly sawdust)

Assortment	Typical Specification	Roadside Value *	End Products
Large Sawlog	Min. Top Diameter of 20cm Min. Length 3.7m; Quality Dependent	€51.00 / m^3	Construction Timber for Roofing, Flooring, Joinery, Decking etc.
Pallet Wood	Min. Top Diameter of 14cm Min. Length 2.4m; Quality Dependent	€30.70 / m^3	Fencing Stakes, Fencing Strainers
Stake Wood	Min. Top Diameter of 7cm Min. Length 1.5m; Quality Dependent	€34.43 / m^3	Timber Pallets, Other Industrial Products, Gate posts
Pulp Wood	Min. Top Diameter of 7cm Min. Length 3.1m; Quality Not Important	€28.00 / m^3 (mill gate) **	Chipboard, Oriented Strand Board (OSB), Medium Density Fibreboard (MDF), Door Facings

Table 2: Round Timber Assortments, their Roadside Values, Markets and End Uses

* Roadside Value is dependent on the location of the forest in relation to the sawmill. Figures presented here are average values paid in Ireland over the last four years.

** The value of pulp is not normally considered at roadside but at the timber processing plant where currently prices of between €25 and €30 are paid per tonne delivered.

[4] The average private forestry plantation size in Co. Clare is approximately 9.2 hectares.

[5] Finsa (Scariff): 180,000 tonnes; Masonite (Drumsna): 160,000 tonnes; Smartply (Waterford): 600,000 tonnes; Willamette (Clonmel): 660,000 tonnes.

may result in difficulties with regard to their ability to produce chipboard and the economics of doing so.

The dominant factors determining the viability or otherwise of pulp wood are the costs of harvesting & extraction and the cost of haulage.

The cost of harvesting & extracting pulp wood to the forest roadside varies considerably depending on whether the pulp wood arises from thinning operations or from clearfelling. There are upward pressures on these costs caused by high labour, insurance, fuel and other prices. However, it is not expected that harvesting costs will increase dramatically if further efficiencies through economies of scale and logistics can be introduced into the sector. For the purpose of this report it is assumed that harvesting and extraction costs refer to thinning situations, as insignificant volumes are expected from private sector clearfells in Co. Clare in the next two decades. Site conditions also influence the cost of extraction, in particular forest roading density and terrain classification.

As for timber harvesting & extraction, there are many cost drivers exerting upward pressure on the cost of haulage. These include higher labour, insurance and fuel costs. However, it is an industry goal to offset these cost pressures with increased efficiencies, particularly through improved fleet management and transport logistics[6].

Table 3 below illustrates the relative costs of harvesting & extraction and haulage.

Haulage Distance	<10 mls	30 mls	80 mls	120 mls
Haulage Cost	16%	21%	36%	48%
Roadside Price	84%	79%	64%	52%
Harvest & Extraction Cost	75%	75%	75%	75%
Standing Price	9%	4%	-11%	-23%

Table 3: Economics of Harvesting, Extracting and Hauling Pulp Wood (Expressed as a % of Mill Gate Price[7])

Coillte currently use the rail network for haulage of pulp wood to Smartply in Waterford. The link from Ennis to Waterford is not currently used by Coillte who find it more economic to haul over this distance (110 miles) by road[8]. A reduction in rail freight charges or an increase in road haulage charges could change this situation and render Ennis as a viable depot for private timber. Scale is the only other apparent barrier to private sector sales to Smartply from Co. Clare using the rail network. A full train carries approximately 400m^3 of timber which is equivalent to 16 hectares of pulp wood from first thinnings. In addition to the operational costs of harvesting, extraction and haulage there are timber marketing, site preparation, sale administration and site remediation costs which must also be paid for. These overhead costs are approximately estimated at €2.00 / m^3 to the timber supplier although a farmer may not cost his / her own time in the same way.

Table 3 demonstrates that for haulage distances greater than approximately 30 miles, pulp wood alone coming from thinning operations cannot be regarded as an economic product in the current market place.

4.5 Stake Wood Market Dynamics

The current national stake wood market is estimated at about 180,000 m^3 and has been buoyant in recent years due principally to the requirement for fencing under the National Roads Programme, the housing boom, the Rural Environment Protection Scheme (REPS) and the Afforestation Scheme. This buoyancy is set to continue in the short to medium term but the market is unlikely to grow proportionally with the rate of increase of timber production. With regard to the value of stake wood, there are two possible scenarios that may arise;

1. The stake wood market hits a ceiling and stake wood sales from Co. Clare do not pass 12,240 m^3 / annum[9]. In this scenario, stake wood holds its value without market growth.
2. So much timber in the pulp wood assortment becomes available on the market that the stake wood price becomes absorbed and they are regarded as the same product.

These scenarios are modelled, along with a maintenance of the *status quo*, in Section 5.

Haulage Distance	<10 mls	30 mls	80 mls	120 mls
Haulage Cost	11%	15%	24%	33%
Roadside Price	89%	85%	76%	67%
Harvest & Extraction Cost	51%	51%	51%	51%
Standing Price	38%	34%	24%	16%

Table 4: Economics of Harvesting, Extracting and Hauling Stake Wood (Expressed as a % of Mill Gate Price[10]).

Table 4 illustrates the relative value of stake wood based on different haulage distances. Practical examples for different scenarios are presented in Section 5.4. It is clear that under present market conditions, all attempts should be made to maximise the production of stake wood and minimise the production of pulp wood from thinning operations. The achievement of this is totally dependent on the quality of the material to be thinned. There is a high quality specification for stake wood which must be both straight and with minimal taper. Well stocked stands of timber where taper is minimised will yield higher percentages of stake wood than poorly stocked stands.

4.6 Current Forest Products Markets for Co. Clare

The prices currently available for stake wood, pallet wood and sawlog (Table 2) mean that thinning woods with a high percentage of these products will yield revenues for timber growers in the county.

[6] Source: Optlog (2002). A COFORD funded study which identified areas of cost and operational inefficiency in the timber supply chain, analysed the reasons for these and developed strategies to overcome them.

[7] The current mill gate price for pulp wood (2004) ranges between €25 and €30 per tonne.

[8] 120 miles is generally considered the threshold distance below which timber haulage is more economic by road. In addition, for rail haulage to be economic, timber must be coming from forests within approximately 30 miles of the point where it is loaded onto the train.

[9] This is crudely calculated as 6.8% (the percentage of the national forest estate in Co. Clare) of 180,000m^3 (the current size of the national stake market).

[10] The current mill gate price (2004) for stake wood ranges between €38 and €45 per cubic metre.

Table 5 presents sample haulage distances and typical costs from mid points in East Clare (Tulla) and West Clare (Cahermurphy) to some major consumers of forest products.

Product	Sample Timber Markets	Cahermurphy (West Clare)		Tulla (East Clare)	
		Mls	Haul Cost (€/tonne)	Mls	Haul Cost (€/tonne)
Pulp	Willamette (Clonmel)	89	10.75	80	10.25
	Finsa (Scariff)	40	6.75	11	4.75
Stake	Standish (Roscrea)	82	10.50	55	8.00
	Coolrain Sawmills	96	11.25	70	9.25
Pallet	Laois Sawmills	106	12.25	79	10.25
	Graingers (Enniskeane)	122	13.50	98	11.50
Sawlog	Murrays (Ballygar)	77	10.25	62	8.75
	Palfab (Macroom)	102	12.00	82	10.50

Table 5: Haulage Distances & Typical Costs from Centres in East & West Clare to Sample Timber Markets

It is evident from the production forecast for the county and from the analysis of current markets and operating costs that local market(s) for the pulp wood assortment are required, particularly in west Clare. A discussion on potential markets for the pulp wood assortment is presented in Section 6.

5 Potential Value of Future Production

Three scenarios have been modelled to predict the future value of timber harvests in Co. Clare. These scenarios are presented below:

5.1 No Change to Present Prices and Markets

This scenario assumes that the current prices available for stake wood remain buoyant and that the demand for stake wood rises in proportion to the rise in timber production. It also assumes that current pulp wood prices are maintained and that new pulp wood markets develop, other than the existing board mills, which adopt existing prices for their raw material. The modelled outcome of this scenario is presented in Table 6.

	2004 2006	2007 2009	2010 2012	2013 2015	2016 2018	2019 2021
Non Farm	16,299,652	26,407,571	21,960,374	27,525,328	31,197,488	32,629,392
Farm	753,576	1,347,525	1,224,123	3,069,198	5,143,163	7,535,191

Table 6: Roadside Value (€) of Timber Harvest if the Demand for Stake Wood and Pulp Wood Rises in Proportion to Total Timber Production

5.2 Stake Wood Market Ceiling Exists

This scenario assumes that the stake wood market hits a ceiling and stake wood sales from the county don't pass 12,240 m^3 / annum which is crudely calculated as 6.8% (the percentage of the national forest estate in Co. Clare) of 180,000m^3 (the current size of the national stake wood market). In this scenario it is optimistically assumed that the private sector can gain 50% market share (6,120 m^3 / annum) in stake wood sales. It also assumes that current pulp wood prices are maintained and that new pulp wood markets develop, other than the existing board mills, which adopt existing prices for their raw material. The modelled outcome of this scenario is presented in Table 7.

	2004 2006	2007 2009	2010 2012	2013 2015	2016 2018	2019 2021
Non Farm	15,391,560	24,823,439	20,936,532	26,472,487	30,241,561	31,793,233
Farm	736,038	1,195,048	1,117,530	1,727,948	1,250,268	1,920,896

Table 7: Roadside Value (€) of Timber Harvest if Current High Demand for Stake Wood Remains Constant

5.3 Stake Wood Price Collapses Back to Pulp Wood Price

In this scenario it is assumed that there is so much material in the pulp wood assortment (top diameter of 7 to 14 cm) that the stake wood price becomes absorbed in the pulp wood price. Like the first two scenarios, there is an assumption here that current pulp wood prices are maintained and that new pulp wood markets develop, other than the existing board mills, which adopt existing prices for their raw material. The modelled outcome of this scenario is presented in Table 8.

	2004 2006	2007 2009	2010 2012	2013 2015	2016 2018	2019 2021
Non Farm	15,053,186	24,485,064	20,598,157	26,134,112	29,903,186	31,454,858
Farm	489,632	880,765	837,552	1,389,574	1,049,004	1,697,877

Table 8: Roadside Value (€) of Timber Harvest if Stake Wood Price Collapses

5.4 Discussion

Each of the above three scenarios demonstrates that regardless of markets, farmers in Co. Clare will remain relatively insignificant in the market place for the next 15 years at least. In terms of the value of timber sales, the non-farmer sector will dominate the market, principally because it will be marketing considerable quantities of valuable sawlog during this period. However, the value of produce from farmer owned forests will steadily rise during the same period. It is considered highly unlikely that the first scenario (Section 5.1) will occur and far more likely that the value of the harvest will be somewhere between what is predicted by the scenarios in Sections 5.2 and 5.3. Therefore, the expected value of farmer produced timber in Co. Clare will be approximately €600,000 / annum by 2020. Figure 8 repeats the possible outcomes for each of the three scenarios for farmer grown stake wood and pulp wood.

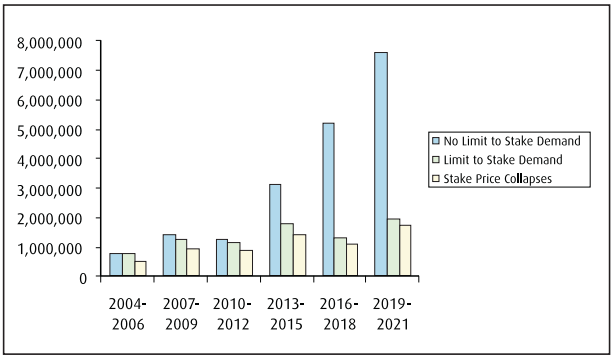

Figure 8: Roadside Value (€) Scenarios for Farmer Grown Stake Wood and Pulp Wood in Co. Clare

The absence of local markets for small diameter timber and the influence of haulage costs combine to leave farmer growers in Co. Clare with marginal prospects for returns from early forestry thinnings. Although it is possible to incur a loss on first thinnings and still achieve significantly better returns than leaving the crop unthinned (Phillips, 2003), many farmer growers will simply decide to leave their plantations unthinned rather than incur an initial cost. The need for new local markets for small diameter timber from early thinnings is clear.

This is best illustrated using examples of two typical sites of 9 hectares and Yield Class 18, one in East Clare and the other in West Clare. For each site, Table 9 presents two scenarios, the first being the current situation as represented in Section 5.2 above and the second assuming that local markets are developed offering the same mill gate price for pulp wood logs as existing markets. Prices used are indicative and are for illustrative purposes only. The cost of timber harvesting and extraction is extremely sensitive to site conditions and to the size of timber to be extracted. Many wet sites may only be suitable for such operations in drier months or may incur higher costs during wet periods. Similarly, while it may be silviculturally prudent to thin early this will incur a higher 1st thin cost than if this were delayed until the timber is bigger.

While all scenarios currently show small returns to the farmer, this is highly sensitive to:

1. Harvesting & Extraction Costs (which are currently experiencing upward pressure);
2. Haulage Costs (which are currently experiencing upward pressure);
3. The relative % of stake wood, pulp wood and pallet wood returned (quality dependent);
4. Site Size;
5. Timber Prices (stake wood prices are currently considered to be buoyant).

Table 10 presents the same data as Table 9 but with a collapse in stake wood prices as presented in Section 5.3 above. This demonstrates the current reliance on stake wood prices which are subsidising the pulp wood element of 1st thinnings. In these examples, the future scenario assumed is that stake wood will be sold to new local pulp wood markets as there would be no premium for hauling it the extra distance just to be made into fencing material.

	East Clare		West Clare	
	Existing Markets	**New Pulp Markets**	**Existing Markets**	**New Pulp Markets**
Plantation Area (Hectares)	9	9	9	9
Productive Area (Hectares)	6.5	6.5	6.5	6.5
1st Thinning Volume (63m³ / ha.)	410	410	410	410
Stake Wood Volume (m³)	205	205	205	205
Example Distance to Stake Wood Market	55	55	82	82
Stake Wood Haul Cost (€)	1491	1491	1955	1955
Mill Gate Stake Wood Value (€41 / m³)	8395	8395	8395	8395
Pulp Wood Volume (m³)	205	205	205	205
Example Distance to Pulp Wood Market	80	15	89	15
Pulp Wood Haul Cost (€)	1908	932	2000	932
Mill Gate Pulp Wood Value (€28 / m³)	5733	5733	5733	5733
Harvest & Extraction Price (€21 / m³)	8600	8600	8600	8600
Sale Overheads (€2 / m³)	819	819	819	819
Return to Farmer (€)	**1310**	**2287**	**753**	**1822**

Table 9: Sample Returns from 1st Thinning in Current & Potential New Markets

	East Clare		West Clare	
	Existing Markets	**New Pulp Markets**	**Existing Markets**	**New Pulp Markets**
Plantation Area (Hectares)	9	9	9	9
Productive Area (Hectares)	6.5	6.5	6.5	6.5
1st Thinning Volume (63m³ / ha.)	410	410	410	410
Stake Wood Volume (m³)	205	205	205	205
Example Distance to Stake Wood Market	55	15	82	15
Stake Wood Haul Cost (€)	1491	932	1955	932
Mill Gate Stake Wood Value (€28 / m³)	5733	5733	5733	5733
Pulp Wood Volume (m³)	205	205	205	205
Example Distance to Pulp Wood Market	80	15	89	15
Pulp Wood Haul Cost (€)	1908	932	2000	932
Mill Gate Pulp Wood Value (€28 / m³)	5733	5733	5733	5733
Harvest & Extraction Price (€21 / m³)	8600	8600	8600	8600
Sale Overheads (€2 / m³)	819	819	819	819
Return to Farmer (€)	**-1351**	**184**	**-1908**	**184**

Table 10: Sample Returns from 1st Thinning if Stake Wood Prices Collapse

6 Potential Markets

Conventional markets for forest timber products are listed in Section 4.3. It has been clearly identified that new markets are required, particularly as an alternative to current markets for small dimension timber (stake wood and pulp wood). Co. Clare requires new markets that will create demand for increasing volumes of pulp wood. It is unlikely that new wood fibre markets similar to the existing panel board industries will develop in the short to medium term in Ireland. Trends in both the international forestry and energy sectors indicate that energy from wood will develop as a new market for small dimension timber. Such developments are generally seen as replacement markets which adopt existing pulp wood prices.

6.1 Energy from Wood

As identified by Electrowatt Ekono and Tipperary Institute, there is significant energy potential in Ireland's forest resource which could yield a number of local benefits including:

- Stimulation of rural development and employment as wood fuel supply chains evolve to meet markets;
- Development of an environmentally beneficial fuel resource to replace the use of fossil fuels and consequently reduce emissions of greenhouse gases;
- The realisation of Government investment in forestry.

There are numerous other nationally important benefits which also strongly support the argument for developing and exploiting the forest wood fuel resource. This is emphasised again by Peter Bacon & Associates (2003)[11] who state that biomass to energy provides a major opportunity for Ireland, using a renewable resource to displace CO_2 emissions from fossil fuels. They recommend that energy from wood should be promoted aggressively in the context of the developing forest industry. The nature of energy from wood can facilitate local demand for small dimension timber on a modular scale which overcomes one of the major economic barriers to forestry development in Co. Clare (cost of hauling pulp wood over long distances to existing markets).

6.1.1 Electricity

Electricity is generated from burning fuels such as oil, gas & coal and in this regard wood is no different. In this instance, wood (usually in the form of chips) is transported to a storage site adjacent to a power plant. From here it is augered or conveyored to a combuster where it is burned and the generated heat is transferred to a steam or hot water boiler. Steam is converted to electrical power by steam turbines. Excess steam and heat can be used in other plant processes. To economically compete with other fuels in electricity generation, a large scale energy from biomass facility would be required. Given the relatively small and uncertain supply from the private sector and inexperience in Ireland of even small scale energy from biomass applications it is considered premature to expect such a facility to develop around farmer suppliers in the short to medium term.

In some cases a mix of primary fuels is used in electricity generation and this process is called co-firing. Co-firing is considered a more attractive means of commencing energy from biomass generation in Ireland due to "piggybacking" on economies of scale, the smaller biomass supply risk, the smaller investment risk for modification costs and the fact that there are a range of proven technologies available. Two possibilities for co-firing exist in Co. Clare:

1. The Moneypoint power station operated by the ESB is a 855MWe facility using coal as the primary fuel. This power station was identified by Van den Broek et al[12] as the lowest cost option amongst co-firing opportunities for wood fuel in Ireland. The power station would require plant modifications to pulverise wood-fuel prior to mixing with the coal fuel stream. The proportion of electricity generated from wood-fuel would be required to contribute to the investment return to both the main plant and the modification investment. Discussions have previously been held between forest industry representatives and the ESB at Moneypoint at which it was confirmed that they would not consider modifying the plant to co-fire wood because of the strategic importance of the plant as part of the nation's portfolio of generating assets (Electrowatt-Ekono & Tipperary Institute, 2003).

2. The new peat fired power station under construction at Shannonbridge in west Offaly is a 150MWe facility. There are no apparent technical barriers to co-firing at this location. A 15% co-firing facility for wood fuel at Shannonbridge would generate a demand for approximately 200,000 green tonnes of timber annually which is equivalent to thinnings from 4,000 hectares of forest. A thirty mile radius from Shannonbridge covers most of the west midlands and the mid west, including east Clare. Electrowatt Ekono & Tipperary Institute (2003) identify this as a possibility but state that there may be non technical barriers to the implementation of co-firing at significant levels such as an unacceptable impact on existing peat fuel supply contracts.

6.1.2 Combined Heat & Power (CHP)

Combined heat and power (CHP) is the generation of thermal and electrical energy in a single process. In this way, optimum use can be made of the energy available from the fuel. CHP installations can typically convert between 80% and 90% of the energy in the fuel into electrical power and useful heat. The efficiency of conventional power generation as described in Section 6.1.1 is generally around 30%[13].

The use of wood fuel in a CHP installation is not a new concept. Such operations are common throughout Europe. Indeed, the first such facility in Ireland is already being installed at Graingers Sawmills in Enniskeane, Co. Cork which will provide 1.8MW of electricity and 3.5MW of heat.

Similar such projects have potential in Co. Clare, particularly for large users of heat. Table 11 illustrates the range of scales of CHP applications for different clients.

[11] Peter Bacon & Associates, Economic Consultants (2003) *Forestry; A Growth Industry in Ireland.* A report commissioned by forest industry members.
[12] Van den Broek et al. (2001) – *"Potential for Electricity Production from Wood in Ireland"*. Energy, Vol. 26 pps. 991-1013.
[13] Kellet, P. (1999). *Report on Wood Biomass Combined Heat and Power for the Irish Wood Processing Industry*. Produced by the Irish Energy Centre – Renewable Energy Information Office, Bandon, Co. Cork.

Client	Size (MWe)	Size (MWth)	Wood Use (Green tonnes/annum)
Utility Plant	25	73	275,000
Industrial Plant	0.2 – 7.0	2.9 – 4.4	10,000 – 100,000
School / Institution	0.5 – 1.0	2.9 – 7.3	5,000 – 10,000

Table 11: Range of CHP scales and Fuel Requirements for Different Clients[14]

It is beyond the resources of this study to research potential clients in Co. Clare with regard to their heat and power requirements and their suitability for conversion from fossil fuels to renewable wood fuel. However, there are a range of public buildings (hospitals, schools, libraries, council offices etc.) and private / commercial premises where a good fit could be found for such an enterprise.

6.1.3 Heat

The provision of heat from wood fuel has progressed considerably from simply burning logs in a fireplace[15]. There has been much recent technological development both in the modification of the wood fuel product (e.g. uniform chip size and standardised wood pellets) and the improvement in efficiency of wood stoves and boilers. While these developments are on-going there are no apparent technical barriers to the use of such technology in Ireland. There is now political support and economic incentive for such initiatives in Ireland, particularly in West Clare. The biggest barrier appears to be changing a mindset from conventional fuel heating systems to new renewable wood fuel systems.

There are opportunities for farmers with forestry to provide heat for small to medium scale applications e.g. apartment blocks, housing schemes, community centres etc. The key point here is that the farmer becomes a heat provider rather than simply a supplier of wood chips. There are many models of such activity throughout Europe. One such example in Austria heats 19 apartments in 4 buildings using a 100kW boiler with 180m^3 of wood chips supplied annually by local farmers. Such applications are replicable and have the potential to transform fuel supply and demand dynamics in rural Ireland.

6.2 Out Wintering Pads for Cattle

The technology used to over winter animals outdoors on beds of timber residues is termed 'Out Wintering Pads' (OWP). This facility is a potentially low cost accommodation system designed by placing a layer of timber residue (woodchip) over an artificially drained surface to allow easy control of solid and liquid wastes during confinement. Substantial savings in overhead costs may be achieved by the adoption of OWPs as an alternative system of winter housing for cattle in slatted sheds.

Teagasc and COFORD are at present actively researching the potential for greater adoption of OWP's. It is estimated that for every 1% of cattle in Clare accommodated on OWPs, a local market of 1,800 tonnes of chip could develop. This is an alternative market option worth pursuing as there is potential for the local use of chipped 1st thinnings, therefore greatly reducing transport costs. Unfortunately, the Rural Environmental Protection Scheme (REPS) does not recognise OWP's as an accepted system and until this barrier is removed, the opportunity for the development of this market is limited.

6.3 Other Added Value Products

As the timber industry in Ireland has developed, so too has the range of added value indigenous wooden products available on the market. Such niche products include garden furniture, garden sheds, horticultural mulch (chips and bark), wood shavings for animal bedding, craft products etc. The range of such products is expected to continue to grow and new entrepreneurial niche markets will be exploited. However, it is expected that such niches will continue to operate on the fringe of the mainstream forest industry and are unlikely to generate significant demand for small dimension timber that will impact on the forecast increase in timber production in Co. Clare as presented in Section 3.

7 Reaching the Market Recommendations

During the course of the study, the issues affecting the potential commercial exploitation of the private forestry resource in Co. Clare were identified and each of these is discussed here. For each issue, a number of recommendations are made that will, if addressed, facilitate the development of an improved market dynamic for forest products in the county. Many of the issues are inter-related and therefore the recommendations associated with one issue are often equally relevant to other issues.

Issue 1
Location of Plantations and Access to Them

Discussion

The survey of professional foresters highlighted this as the most critical constraint to the commercial exploitation of the private forestry resource. The field survey showed that 56% of plantations required the construction of access roads from the public road with the mean distance requirement to all sites being 83 metres. Of the 44% with good road frontage there is still a requirement to construct an entrance way into the forest in which timber can be stacked and lorries can pull in or turn. The loading of timber lorries is not permitted on public roads. On top of this, 51% of sites also required internal access roads with a mean distance requirement across all sites of 94 metres. The average roading requirement for farmer owned plantations in the county is 177 metres. Without such roads, less than half of the farmer owners in the county will realise a direct financial return from their forestry. This is now a major issue which requires addressing.

[14] Sourced from TechLine, a technical information sheet series produced by the Forest Products Laboratory, State & Private Forestry Technology Marketing Unit, Forest Service, United States Department of Agriculture. Sheet entitled *Wood Biomass from Energy.* Published 2004.

[15] Local firewood markets are still active and although insignificant on a national or regional scale can be an important local means of selling the pulp wood assortment from timber harvests.

The Forest Service offer grants to assist with the construction of forest harvesting roads and these are payable at a maximum rate of €28.57 per linear metre. Assuming this grant covers 80% of the construction cost, as it is intended to do[16], the average roading cost per plantation will be approximately €6,300 of which 80% is refundable through grant assistance. Based on planting statistics and the above data, it is estimated that the annual cost to the Forest Service for forest harvesting roads on farmer owned sites in Co. Clare could be approximately €280,000 up until 2010. The annual national spend on forest road grants has averaged approximately €1.4 million over the last eight years. This is clearly not going to be adequate considering that Co. Clare is only one county of many with imminent forest harvesting and roading requirements.

The public road network will also be required to facilitate timber lorries *en route* from the forest to timber processors. For many roads in rural areas, local weight restrictions apply (which are well below the national gross tonnage restrictions) which render the already challenging issue of timber haulage even more uneconomic through the need for double handling of timber, extra stacking / loading facilities and extra forwarding distances. The planning of sustainable public road usage by the private forestry sector is not possible in the absence of a spatial timber inventory and production forecast. In the meantime, county planners and engineers need to become familiar with the issues regarding timber haulage. Timber owners have a right to be able to market their produce, just like any other farm produce.

In order to qualify for a roading grant, land owners must get written permission from the county council in situations where a new forest entrance is required onto a public road. In many instances, this requires going through a full planning application.

Recommendations

1.1 The need for forest roads must continue to be highlighted by forestry professionals interacting with forest owners and there should be a clear message that the development of access for timber lorries is an integral part of forest management.

1.2 The Forest Service in the Department of Agriculture and Food should prioritise the grant aiding of forest harvesting roads for areas with an immediate requirement for thinning and should ensure that there is no delay in this process. This will require a considerable increase in the national spend on forest road grants.

1.3 A detailed spatial, quantitative and qualitative forest inventory is required for the county (and nationally). This is a fundamental requirement for long term forestry and county development planning, for example the planning of timber transport routes (see recommendations 3.2, 4.1 & 6.5).

1.4 A series of dedicated haulage routes and an agreement with county planners and engineers with regard to timber haulage and entrances to forest properties are required. The Code of Practice for Timber Haulage[17] and the Forest Road Manual[18] should be used as reference documents. Bodies representing farmer owners should be party to such agreements and forestry must not be penalised relative to other farm or rural enterprises.

1.5 Because of the high cost of timber haulage, local markets for timber require development under the principle of bringing the market to the resource rather than the resource to the market. Recommendations 7.1 to 7.5 are more specific in this regard.

Issue 2
Farmers' Knowledge of and Enthusiasm for Forestry

Discussion

The farmer survey demonstrated a good general awareness that thinning of plantations constitutes normal / best practice. Indeed, 58% of farmers actually planned to thin their crops when the time was right. However, there was no clear indication from farmers that they knew when this would be, what was involved or how to go about it. It is also clear that farmers are currently not prepared to thin their plantations at a loss in the short term, despite the fact that they acknowledge the potential for long term gain. Farmer owned forests which have an imminent requirement for first thinning are well known by other farm forest owners throughout the county and will be viewed by them and by other stakeholders in the forest industry as case studies. This audience will watch both harvesting practice and financial returns and will form their own opinions on the merits or otherwise of thinning.

Most farmers with forestry are in receipt of annual premium payments which act as a compensatory payment for the loss of income previously received while the land was in agricultural production. This premium payment is linked to forest management through a maintenance inspection in year 4 and the production of forest management plans (for sites greater than 10 hectares) at years 4 and 10. For all other years (the premium is payable for 20 years), payment is independent of any inspection confirming best practice or otherwise. Farmers tend to view the premium, rightly or wrongly, as their entitlement, regardless of the degree of effort put into forest management activities. Those farmers who planted their forests before 1987 receive no annual premium and those who planted in the years 1987 to 1989 receive a small compensatory payment worth €94 / hectare. The normal forestry premium for those who planted from 1990 on is approximately €400 / hectare[19]. Those farmers in receipt of very small or no annual premiums are the ones who, having pioneered private forestry establishment in the county are now faced with the task of pioneering private timber harvesting and marketing also.

The age profile of farmer owners in Co. Clare is highly relevant to the future prospects for developing a dynamic timber market in the county. Survey results show that 86% of growers are over the age of 45 and 39% are older than 60. Most of these farmers are unlikely to reap the full

[16] Forest Service (2003). Forestry Schemes Manual. Government Publications Office, Molesworth St., Dublin 2.

[17] The Code of Practice for Timber Haulage has been developed by the Forest Industry Transport Group which is made up of the relevant industry groupings and in conjunction with the Irish Forest Industry Chain and COFORD.

[18] Published by COFORD, Dublin.

[19] The actual amount payable as an annual forestry premium is dependent on the species planted, the plantation size and whether or not the applicant qualifies as a farmer or as a non-farmer.

reward themselves from the sale of a final timber harvest at clearfell. It is highly likely that most of these plantations will change ownership during the course of their first productive rotation. In some cases, change of ownership has already occurred and there is a trend away from ownership by full time farmers towards ownership by part time farmers or non farmers. This is also a relevant factor for consideration in relation to day to day forest management.

The development of forestry knowledge amongst farmers, while greatly assisted by training courses and promotional activities, is also a function of time. As the private forestry estate in the county matures, so will the knowledge and understanding of forest management amongst both farmers and the population as a whole.

Although some farmers clearly have more commercial forests than others, it would be wrong to suggest that those with smaller, less productive, less accessible or poorer quality blocks will derive no benefit from these forests. In many cases these blocks are providing important shelter for livestock. In some cases they are already being used as a useful source of domestic firewood. In addition to this, a block which may be currently un-commercial for thinning may one day be valuable as a clearfell.

Recommendations

2.1. Good case studies of private sector thinning are required now which can be used as an educational resource for both owners and foresters. It is essential that the current low levels of timber production are handled well before the big rise in production around 2013.

2.2. It is considered justifiable that the Forest Service or other agencies of the state prioritise assistance in the form of roading grants, market development and extension services for farmers with an immediate requirement for thinning based on the fact that:
- There are only a small number of farmers who are not in receipt of premiums and who are now faced with pioneering the development of private timber harvesting and marketing;
- Investment at the early stages of private timber marketing will benefit future comers to the market whose production potential is very large. It is considered imperative that best practice prevails for these early plantations and that they be used as good case studies from which farmers with younger crops are inspired.

2.3. Promotion and training services provided by the Forest Service and Teagasc should continue to develop into the areas of timber harvesting and timber marketing.

2.4. The "on farm" uses of small blocks of forestry which currently may not be attractive for commercial exploitation should be highlighted and promoted by both the Forest Service and Teagasc.

Issue 3
Plantation Size, Productivity & Quality

Discussion

The average area of farmer owned plantations in Co. Clare is approximately 9 hectares with a range from 0.24 hectares to 120 hectares. From the survey, the average productive area within these plantations is 73% of the total area. Given that 75% of owners surveyed said that their near neigbours had forestry of a similar age and that 47% of owners said that they also owned other blocks of forestry, the effective area could be considered larger than 9 hectares in many cases.

Plantation size and therefore total timber volume is an important factor in determining the attractiveness or otherwise of a timber sale both to a harvesting contractor and a timber processor. The minimum viable plantation size for economic thinning reduces with each subsequent thinning. It is likely that co-operative marketing will evolve in an entrepreneurial manner with professional foresters (either as individual consultants or forestry companies), working with harvesting contractors and timber processors, offering such a service. Indeed, some professional foresters surveyed have definite plans and the client base to achieve this. There are at least 33 professional foresters active in the private sector in the county and they are likely to develop their businesses as timber sales managers.

Grouping of forest properties for co-operative marketing will increase the number of sites that become commercially attractive for thinning by reducing the threshold area of such sites. However some sites, even with co-operative marketing, will still not be economically attractive to conventional forestry systems and markets.

The average Yield Class of plantations surveyed was $18m^3.ha\text{-}1.year\text{-}1$. Apart from a few exceptions, exposure to wind has not yet become a significant factor in the development of plantations and there has been no resulting reduction in quality of note, relative to the national forest estate.

Recommendations

3.1. As much as is possible, forest management should be licensed and controlled through the approved (professional) forester system whereby best practice is monitored through auditing of the forester rather than the farmer. The placement of responsibility with the professional forester should lead to a more dynamic and entrepreneurial system, in which timber harvesting and marketing overheads can be reduced (see recommendation 5.3). This will facilitate the grouping of different sites by professional foresters or other agents for co-operative harvesting and marketing activities.

3.2. A detailed spatial, quantitative and qualitative forest inventory is required for Co. Clare (and nationally). This is a fundamental requirement for long term forestry and county planning, particularly in relation to facilitating the linking of forest sites for co-operative timber harvesting and marketing (see recommendations 1.3, 4.1 & 6.5).

Issue 4
Industry Leadership & Co-ordination

Discussion
The Forest Service in the Department of Agriculture and Food is the regulatory authority with responsibility for forestry in Ireland. Within the industry there are other bodies which represent sectors such as timber processing, professional foresters, forestry contracting, timber growers etc. All of these bodies have a role in working with the Forest Service in providing leadership and direction for the forest industry at local and national levels. The issues identified in Co. Clare are considered to be similar in most Irish counties that have experienced rapid growth in forest cover over the last two decades. It is therefore essential that the correct policy framework exists at a national level if opportunities at a local level are to be maximised.

The national issues of particular importance to the development of the private forestry market in Co. Clare relate to markets for small diameter timber, forest inventory and planning, grant assistance for forest management activities, professional standards / best practice and the role of training / extension agencies.

Most of the large timber processors and some contractors operate at a national level and are used to a single standard in terms of timber sales presentation, timber measurement and timber procurement systems. While individual professional foresters are involved in timber harvesting and marketing, the volume from such sales is relatively small in comparison to that supplied by Coillte. Despite this, many professional foresters are involved in private timber harvesting and marketing and are learning this business through experience.

Although farmer owners have access to a list of approved foresters from the Forest Service, there is no comprehensive industry database of timber processors, harvesting contractors, hauliers and other forest industry members available.

Fifteen per cent of Co. Clare is now under forestry and this level of land use will need to be reflected in any review of the county development plan.

Recommendations
4.1. A detailed spatial, quantitative and qualitative forest inventory is required for Co. Clare (and nationally). This is a fundamental requirement for long term forestry and county development planning (see recommendations 1.3, 3.2 & 6.5). This needs to be co-ordinated at a national level so that data from different counties is collected and presented in a standard format and is directly comparable and useful.
4.2. A national standard for timber sales data presentation and timber sales & security management should be adopted for use by the public and private sectors (this should incorporate a timber measurement standard[20] and a national timber removal permit system).
4.3. There is a continuous professional development (CPD) demand amongst professional foresters for training in timber measurement, harvesting and marketing. This should be met through one of the forest industry's existing training and education service providers.
4.4. A comprehensive database of timber markets, harvesting contractors, timber hauliers, other contractors and foresters should be maintained by the Forest Service, Teagasc and / or other agencies for use by forest owners and other members of the forest industry.
4.5. Regional pilot / demonstration projects providing small scale CHP or heat should be funded and led by the Forest Service, in association with Sustainable Energy Ireland, in the interest of developing new markets for small diameter timber in areas remote from existing pulp wood markets. One such region is west Clare (recommendations 7.1 - 7.3).

Issue 5
Forest Harvesting Contracting Resource

Discussion
There are forest harvesting constraints in Co. Clare which necessitate careful selection of both a suitable harvesting system and harvesting equipment / machinery. The combination of good forest management planning and good harvesting practice are of particular importance.

The ground survey shows that 46% of farmer owned sites have poor ground conditions which principally refers to ground wetness and soil bearing capacity. Ground roughness presents less of a problem in Co. Clare (21% of sites were considered rough). Given that modern harvesting systems, particularly on wet sites, rely on the creation of a brash mat[21] for heavy machinery to travel over, it is unlikely that this resource will be available for other uses such as wood fuel.

There is a large capital outlay involved in establishing and running a timber harvesting business that offers contracting services to the forest industry. Forest harvesting machines are extremely expensive[22] both to purchase and maintain. They carry a large overhead which requires them to be in constant production. This requires forward planning on the part of the contractor to ensure that loss of production is minimised between harvesting sites / contracts.

Recommendations
5.1. Forest research agencies should continue to support the development of sustainable harvesting systems and low impact equipment for Irish conditions.
5.2. The sensitive treatment of wet sites and strict adherence to Forest Harvesting and the Environment Guidelines[23] by harvesting contractors is essential and should be closely monitored by professional foresters.
5.3. As proposed in the Optilog Study (COFORD, 2002), an overall efficiency based objective of the harvesting infrastructure should be to minimise machine movement and downtime and to maximise productive harvesting time. The achievement of this in the private

[20] Timber Measurement Manual – Standard Procedures for the Measurement of Round Timber for Sales Purposes in Ireland (2000). Published by COFORD, Dublin
[21] A brash mat is created from the tops and branches of trees that are removed by the harvesting machine and placed in it's path to travel over.
[22] A new harvester will cost in the region of €350,000 and a new forwarder approximately €200,000.
[23] Forest Harvesting and the Environment Guidelines (Forest Service, 2000).

sector would be facilitated by the removal of logistical barriers to the passage of machines between different private forests or between public forests and private forests. One such barrier identified at present is the requirement for felling licences for thinning operations. As proposed in recommendation 3.1, the licensing of foresters to carry out best practice would be a more efficient way of regulating felling than on a site by site or farmer by farmer basis.

5.4. A comprehensive database of timber harvesting contractors offering services in Co. Clare should be prepared and made available.

Issue 6
Forest Management

Discussion

Forest management is closely monitored through the establishment phase and is controlled through the grant system whereby maintenance grants are payable when crops are 4 years old if the establishment has conformed with best forest practice. Although management input generally reduces at this stage, there are some important management actions which directly improve a crop's marketability. These include the preparation of a stand map and timber production plan, the cutting of inspection paths, the provision of road access for timber lorries, the estimate or measurement of thinning volumes, high pruning etc.

After the year four inspection there are often other forest management decisions to be made relating to crop nutrition, drainage, fire prevention and trespass prevention. These issues are sometimes forgotten and if not managed can also seriously undermine the productivity of the crop, only to be discovered when the crop is ten years of age or older.

The selection of a suitable harvesting system and thinning schedule is a professional forest management decision and can only be made with specific site and local knowledge. There are a number of options open to foresters and forest owners in terms of thinning intensities and schedules. The correct decision can only be made on the site with all the specific factors reviewed and discussed. The timing of first thinning is important in Ireland due to our windy climate and the wet mineral soils that so often typify plantations[24]. If delayed, trees can get drawn up and top heavy so that when thinning is carried out the crop is rendered unstable and liable to windthrow.

Recommendations

6.1. A thinning policy should be encouraged on all sites where this is silviculturally possible and economically sound. This will increase the value of the owner's forest asset and at a national level, the value of the forest industry as a whole (Phillips, 2003). Sixty nine per cent of farmer owned sites in Co. Clare were deemed thinnable in the ground survey.

6.2. There is a need to foster a closer link between farmers and forest management and this may be achieved by linking premium payments to best forest management practice. Compliance by professional foresters and harvesting contractors with best practice should negate the requirement for felling licences for first and second thinning which will remove inertia and add dynamism to the timber harvesting and marketing sectors.

6.3. Where thinning is selected as the appropriate option, early thinning is essential to minimise windthrow risk.

6.4. There is a requirement for on-going research into the most suitable thinning intensities / systems for plantations on wet and windy sites. It is likely that current practice can be improved through research both in terms of minimising windthrow risk and optimising timber quality and yields.

6.5. A detailed spatial, quantitative and qualitative forest inventory is required for Co. Clare (and nationally). This is a fundamental requirement for long term forestry and county development planning (see recommendations 1.3, 3.2 & 4.1).

6.6. Promotion and training services provided by the Forest Service and Teagasc should continue to develop into the areas of timber harvesting and timber marketing.

Issue 7
Development of New Markets

Discussion

There is no doubt that the biggest motivational factor that will facilitate the achievement of all the other recommendations listed above will be the potential for commercial gain from timber sales. This is clearly the most important issue of all to be addressed as it is unlikely that progress will be made in the development of the forestry resource without the development of a market for small dimension timber from thinnings.

At present, relatively strong markets for stake wood and pallet wood are partially subsidising the harvesting of pulp wood in Co. Clare which cannot realistically be cut and transported for less than the current mill gate value. Elimination of, or a large reduction in, transport costs is required if pulp wood is to become an economically viable product in the county. The provision of new local markets for pulp wood is therefore necessary if the growing forest resource is to realise its full potential.

International and national trends towards the use of renewable sources of energy such as woody biomass are significant and would appear to harbour the solution to the problem outlined above. These solutions occur at small medium and large scales from the use of wood in domestic stoves to the use of wood in large scale power generation. Although it is difficult to forecast what price such new markets will offer for pulp wood it is common for them in their business planning and financial modelling to assume that the cost of their raw material will be the same as is currently paid by other markets for the same material. There are opportunities for timber growers to add value to this price by integrating their enterprises into the heat and

[24] Phillips, H. (2003). Realising the Potential of Private Plantations. Unpublished paper commissioned by COFORD.

energy provision sectors and therefore not to simply sell wood (either round or chipped) but to sell heat and / or power.

Other new markets for forest products are emerging but are only likely to create small demand, primarily from existing timber processors but also directly from forest owners.

Recommendations

7.1. A complete database of major heat and power users in Co. Clare should be prepared which could be used as a basis for market research in the provision of heat and power services using wood fuels. A ranking system should be used in highlighting those users for which a wood heat / energy solution appears most attractive. The planning section of the Office of Public Works should also be made aware of the need for and benefits from wood heat / energy and existing and planned buildings under their care included in the database. Buildings associated with the planned new Shannon Development e-town project in Miltown Malbay and Newport (Tipperary) should be similarly targeted. This should be followed up with a promotional campaign in which the concept of changing to wood fuel systems is aggressively marketed.

7.2. Following on such research, a small to medium scale block heating, district heating or CHP facility should be developed which could be used as a replicable case study which would take on local, regional and national significance. Ideally this facility should be developed in mid to west Clare. Such a project should be supported by both the Forest Service and Sustainable Energy Ireland.

7.3. Community based integrated enterprises in which farmer growers can add value to their pulp wood product by becoming heat and / or power providers should be investigated in more detail and piloted if viable.

7.4. A political effort is required to remove the non-technical barriers to co-firing of peat and wood at the planned Shannonbridge Power Station.

7.5. Support should continue to be provided through the usual sources (County Enterprise Board, LEADER Company etc.) for enterprising and commercially viable new niche products utilising the wood or forest resource.

7.6. The issue surrounding the non acceptance of out-wintering pads for cattle under the REPS needs to be addressed and this obstacle to the development of such a local market for small dimensioned timber removed.

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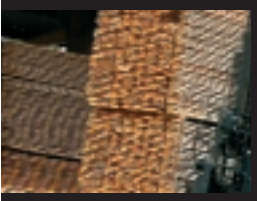

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