

# Plantations and social conflict: exploring the differences between small-scale and large-scale plantation forestry

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## ABSTRACT

Commercial afforestation of agricultural land is often associated with social conflict over the perceived environmental, economic and social impacts of the plantations being established.

One of the most common solutions suggested to this conflict is a shift from large-scale afforestation by companies and government agencies, to small-scale afforestation by individual land holders. Small-scale afforestation by farmers is argued by many to have more positive and fewer negative impacts than large-scale afforestation by non-farmers. However, few studies have examined whether small-scale afforestation is associated with less social conflict than large-scale afforestation.

This paper reports results of a recent study that compared afforestation conflicts in two regions: County Leitrim in the Republic of Ireland, and the Great Southern region of Western Australia. Considerable afforestation has occurred in both regions in recent decades, and both have also experienced significant shifts in the scale and ownership of the plantations being established over time.

Establishment of small-scale farm forest plantations was in both regions associated with considerably less social conflict than establishment of large-scale plantations by non-farmers. This paper explores potential explanations for this pattern, drawing on comparisons between the two case study regions.

## INTRODUCTION

Tree plantations supply a rapidly growing proportion of global wood supplies<sup>1</sup>, and rates of plantation establishment have risen rapidly in many countries in recent years. While estimates made in different years are not directly comparable<sup>2</sup>, the FAO (2001) estimates that the global plantation<sup>3</sup> estate expanded by 143.4 million ha between 1990 and 2000, compared to only 25.8 million ha between 1980 and 1990. Afforestation rates have increased for a range of reasons, including pressure to reduce logging of natural forests, and the quality and consistency of the wood and paper products that can be produced from plantations (Cossalter and Pye-Smith 2003; Kanowski 2005).

This increased rate of afforestation has often been accompanied by conflict over the environmental, social and/or economic impacts of plantations. Disputes and concerns about afforestation have been documented in more than 35 countries covering most, if not all, regions in which commercial afforestation has occurred on a large scale in recent decades<sup>4</sup>.

Concerns expressed about afforestation cover a wide range of topics. For example, some groups express concerns over the perceived social impacts of plantation expansion on rural communities, while others are primarily concerned about the perceived environmental impacts of particular types of afforestation (for example, impacts on water quality and quantity, chemical use, and diversity of species being planted)<sup>5</sup>.

Many people argue that conflict tends to occur over large-scale afforestation more often than

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small-scale afforestation. For example, Mutch and Hutchison (1979: 111) found that conflict over afforestation occurred mostly when afforestation involved 'the purchase and planting of whole farms' in Scotland, rather than only part of the farm. Similar results were found in Australia by Tonts et al. (2001) and Schirmer (2002).

Based on this, some argue that conflict over afforestation can be addressed by shifting from large-scale afforestation undertaken by companies and government agencies, to small-scale afforestation undertaken by individual landholders. The latter is usually described as involving integration of afforestation with traditional agricultural activities in what is commonly termed 'farm forestry' or 'agroforestry' (e.g. Petheram et al. 2000; Tonts et al. 2001; Schirmer 2002).

Small-scale afforestation by farmers is argued by many to have more positive and fewer negative impacts than large-scale afforestation by non-farmers. The benefits of farm forestry/agroforestry compared to larger-scale afforestation are argued to include<sup>6</sup>: more equitable sharing of the benefits of afforestation; maintaining rural populations; maintaining traditional agricultural activities; environmental benefits; and diversification of farm income (CFPLM 1989; Cossalter and Pye-Smith 2003):

*Farm forestry, in particular, has the potential to generate real environmental, social and economic benefits for rural communities if planned and managed properly. (An Taisce 1990)*

*The promotion of smallholder tree-growers is necessary to meet the aspirations of many stakeholders/actors to have a fair share of the cake. (Tewari 2001: 349)*

However, few studies have examined whether small-scale afforestation is less commonly associated with social conflict than large-scale afforestation, despite many recommending small-scale forestry as a solution to concerns held about afforestation.

This paper reports results of a study that compared afforestation conflicts that have occurred in two regions: Co Leitrim in the Republic of Ireland, and the Great Southern region of Western

Australia (WA). Considerable afforestation has occurred in both regions in recent decades, and both have also experienced significant shifts in the scale and ownership of the plantations being established.

## METHODOLOGY

The overall goal of the study was to identify the factors associated with successful change in different types of conflict over afforestation. This question was explored via longitudinal qualitative research in two case study regions: the Great Southern region of Western Australia (WA), and County (Co) Leitrim in the Republic of Ireland.

For the purposes of the study, 'afforestation' was defined as the establishment of stands of trees on land which previously had few or no trees growing on it, while the term 'plantation' was defined as a stand of trees that was artificially established by humans, eg by planting seedlings (after Helms 1998 and FAO 2000). Unless otherwise stated, only afforestation/plantation management for the purpose of commercial wood production was examined.

Conflict was defined as underlying disagreement causing concerns and/or disputes over afforestation, usually evidenced by protracted disagreement between, or expressions of concern by, individuals or groups<sup>7</sup> (after Yarn 1999).

Several dimensions of successful change in conflict were identified, consistent with Stern and Druckman's (2000) suggestion that multiple criteria should be used for evaluating different elements of successful change in conflict. Conflict was considered to have changed 'successfully' if (a) conflict participants with differing viewpoints agreed the conflict had changed successfully, (b) goals of conflict participants had been partially or completely met; (c) frequency of reporting of conflict had fallen or the nature of reporting changed to indicate a lessening of intensity of conflict.

The two case study regions were selected as:

- They had experienced considerable afforestation over time, including periods of relatively rapid and relatively slow afforestation;

- The types of afforestation had changed over time, particularly who undertook afforestation and the scale of individual plantations. There was also some change in the tree species established;
- Conflict had occurred over afforestation, and the topics and intensity of conflict had varied over time, allowing comparison of factors associated with the presence and absence of conflict; and
- The regions were sufficiently similar to allow comparison across case studies<sup>8</sup>.

In each of the case study regions, data was gathered on afforestation and associated concerns/conflicts over time. The time period studied in each case study region encompassed as far as possible the period during which significant afforestation had occurred (1960s to present in Co Leitrim, and 1980s to present in WA).

The primary data sources utilised were:

- Semi-structured interviews conducted with those involved in and/or observing afforestation and conflict over afforestation in the two case study regions (23 interviews in Co Leitrim, and 24 interviews in WA). Those interviewed included representatives of the farming sector, rural residents not involved in farming, the plantation sector, local and State government, environmental and other non-governmental organisations (ENGOS and NGOs), and those involved in facilitating or mediating processes attempting to address conflict;
- Local media articles. All articles discussing afforestation in the Leitrim Observer (1968 to 2000; 582 articles identified) and the Albany Advertiser (1986 to 2002; 471 articles identified) were identified and analysed; and
- Documents discussing afforestation from a range of other sources, including local government, different groups (e.g. plantation companies, ENGOS).

Data was analysed by thematically coding all data sources, and comparing different data sources to identify overlap and variance in reports of the same events and interpretation of their outcomes. Coding themes were developed from initial reading of a sub-set of media articles, interview transcripts and other data from each case study region. These

were then tested on a set of different data to see how comprehensive they were and, after revision, used to code different data sources (following the approach used by authors such as Bengston and Fan [1998]). The coding process remained open-ended, with actors/topics/events added and coding categories refined as new issues emerged in the process of data analysis. This flexible approach was needed as a wide variety of issues and actions occurred in each case study region over time, not all of which emerged in the sample of data used to develop the initial set of codes (Koopmans and Statham 1999; Rucht and Niedhardt 1999).

In each case study region, multiple conflicts were identified over afforestation. Individual conflicts were defined as identifiable topics acted on by particular clusters of actors, which were demonstrably separate to other topics and groups of actors. In total, 14 conflicts were identified – six in Co Leitrim and eight in WA.

Each of the 14 conflicts was analysed to identify whether the conflict had changed successfully or unsuccessfully at different points in time, using the criteria identified above. Theories on factors affecting (a) occurrence of conflict and (b) continuation of conflict, were examined to identify whether conflicts did consistently change successfully or unsuccessfully in association with these theorised factors.

One of the key theories examined was whether different patterns of conflict occurred in associated with small scale and large scale afforestation, and whether changes in the scale of afforestation in a region tended to be associated with shifts in the type and intensity of conflict. Results related to scale of afforestation are presented below.

## RESULTS

When examining theories about the influence of scale of afforestation, the first issue was that of defining ‘small-scale’ versus ‘large-scale’ afforestation. Distinguishing between these concepts was the first stage of analysis, and required uncovering and unpacking the features different individuals and groups typically associated with different scales of afforestation in the two case study region.

Following this, the extent to which small-scale and large-scale afforestation had occurred in each case study region over time was identified as part of a detailed history of afforestation and associated social conflict developed for each case study region. This enabled subsequent analysis of whether particular types of conflict occurred in association with different scales of afforestation.

### Defining 'small-scale' and 'large-scale' afforestation

Rather than impose an arbitrary definition of 'small-scale' and 'large-scale' afforestation, discourse analysis was used to identify how these concepts were defined by different groups in the case study regions.

When the language used by interview respondents, in media articles and in other documentation on afforestation was analysed, some interesting issues emerged regarding the way the scale of afforestation was identified in both case study regions.

Specific terms were associated with either 'small-scale' or 'large-scale' afforestation in both case study regions. In general:

- Small-scale forestry was referred to as farm forestry (both regions), sharefarming (WA), agroforestry (WA), and integrated forestry (WA). In both regions these types of plantations were almost always described as being established and/or managed on properties owned by farmers;
- Large-scale forestry was referred to as private forestry, plantations, blanket forestry (Co Leitrim) and plantations, wall-to-wall or fence-to-fence plantations (WA), amongst other terms. These terms were mostly used when describing afforestation undertaken by businesses or government agencies other than farmers.

The key distinguishing feature between small-scale and large-scale forestry in both case study regions was ownership. Small-scale afforestation was almost always identified as an activity undertaken by farmers or other individual landholders, while large-scale afforestation was generally identified as being undertaken by

companies or government agencies specialising in plantation establishment and management.

The physical area of individual plantations was of less importance as a distinguishing feature. However, the use of terms such as 'blanket forestry' 'wall-to-wall' or 'fence-to-fence' plantations suggests that plantation scale was still partly defined based on the physical scale of individual plantations. However, in all cases these terms were only used when describing afforestation undertaken by businesses or agencies, and were not used when describing afforestation by farmers.

While ownership of plantations was the primary feature distinguishing between small and large-scale afforestation at the individual plantation scale, the discourse used did indicate that distinctions were also made between small and large-scale forestry at a broader landscape scale. Landscapes that had large areas of plantation 'blanketing' the area were generally distinguished from landscapes with small patches of plantation interspersed amongst traditional agricultural land uses; the former was considered to have experienced large-scale afforestation and the latter small-scale.

Small-scale afforestation, therefore, was conceptualised relatively similarly in both case study regions as afforestation controlled by individual landowners, which may be relatively scattered in an agricultural landscape. Large-scale afforestation was conceptualised as afforestation in large single blocks that cover a reasonable proportion of a landscape, and is undertaken by businesses or agencies rather than individual landholders. It is not possible to define a physical size of plantation that was considered 'small' versus 'large' in the two case study regions, with the term 'scale' referring more to the scale of operations of the owner of the plantation, than the size of any individual area afforested.

### Brief history of afforestation - County Leitrim

County Leitrim is a small county in the north-west of the Republic of Ireland. At 159,003 hectares, it covers only 2.2% of Ireland (Western Development Commission 2004). In the early 1900s, very little

of the county was forested. After the State began efforts to afforest land in the County, the forested area gradually increased. By 1987, 8.92% of Leitrim was forested; by 1992 the area covered was 11.11% and by 1997 12.9% (DE 17/11/1998 Vol 496: 1369-1370). Most plantations are coniferous, including Sitka spruce (*Picea sitchensis*) and other conifer species. Over the past two decades a wider range of species has been planted, including non-coniferous species.

Afforestation in its modern forms began in the County from around the 1940s, when the State began to acquire properties considered marginal for traditional agricultural purposes and establish plantations on them. However, many farmers believed the land being acquired and afforested by the State was viable for agricultural use, and also believed the State was paying unfairly low prices for land. During the 1970s, several properties were picketed by farmers in an attempt to prevent their afforestation. From the 1980s, private companies were the primary drivers of afforestation, utilising funds from superannuation companies and private investors to purchase land and afforest it. Within a year of the private sector starting to undertake afforestation in the County protests occurred over a

number of issues, many centring on a strong belief that the land being afforested should have been made available to local farmers. Significant farmer-based afforestation only began to take place from the late 1980s, when the government introduced annual premium payments for farmers who afforested, in addition to existing grants which covered a large part of the cost of establishment.

Figure 1 shows afforestation in Co Leitrim from the 1960s through to 2000, covering the time period examined in the study. The dramatic change in the agents undertaking afforestation from the 1980s can be clearly seen, with the State rapidly reducing its afforestation and private sector groups – including considerable numbers of farmers in the 1990s – undertaking more afforestation.

### Brief history of afforestation - Great Southern region (WA)

The Great Southern region is a group of 12 local government areas located in the south of the Australian state of Western Australia. Clearing of natural vegetation to create farmland occurred in the region from European settlement through to the 1980s, when regulations were introduced

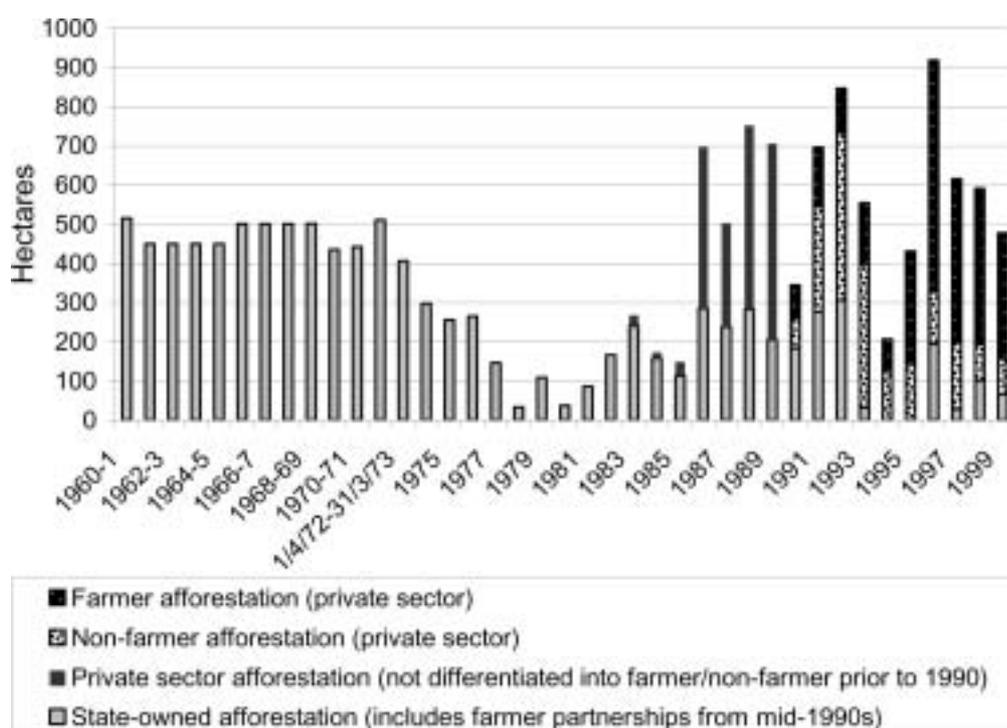


FIGURE 1: AFFORESTATION IN CO LEITRIM, 1960 TO 1999  
Sources: Forest Service (2000); Dail Eireann reports of forestry statistics

preventing large-scale land clearing. Almost no commercial afforestation occurred in the region prior to the late 1980s, although during the 1980s many landholders planted trees on their properties for environmental purposes such as reducing the risk of salinity.

Commercial afforestation began in the region in the late 1980s, and the large majority of plantations are of *Eucalyptus globulus* (bluegums) grown on a 10-12 year rotation to produce woodchips. Initially, almost all afforestation was small-scale, taking place under what were termed 'sharefarm' arrangements. Under these arrangements, farmers entered into a partnership with the Department of Conservation and Land Management (the State forestry agency). CALM established a plantation on part of the farmer's property, paying the landholder an annual lease fee for use of their land and/or sharing eventual profits from sale of the trees with the landholder.

In the early 1990s, several private companies, funded by Japanese companies or by private individuals investing through prospectus schemes, began establishing plantations under similar sharefarming arrangements. The annual rate of afforestation increased relatively rapidly. From the mid-1990s, some plantation companies began purchasing properties directly to establish plantations, and it became increasingly common for entire properties – rather than only a part of a property – to be leased or purchased for plantation

establishment. Increasingly, plantation establishment was more large than small-scale. Afforestation rates peaked in the year 2000 when a change in tax law forced some companies to effectively plant two years worth of planned planting in a single year<sup>9</sup>, and subsequently fell. Since 2003, rates of establishment have risen again.

Figure 2 shows afforestation in the Great Southern region of WA from 1991 to 2001. Available statistics do not separate afforestation based on the ownership (e.g. farmer or non-farmer) or size of individual plantings<sup>10</sup>. The point at which the scale of planting and land ownership arrangements shifted substantially is therefore indicated separately on Figure 2, based on the reports of interview respondents about changes in the nature of afforestation over time.

### Conflict and scale of afforestation

Several approaches were used to identify if small-scale and large-scale afforestation were associated with different types or intensity of conflict. First, the views of interview respondents were identified. Secondly, terminology used by interview respondents, in media reports and in other documents was examined to identify whether conflict tended to be associated with particular small or large scale afforestation. Finally, differences in occurrence of particular topics of conflict in relation to small and large-scale afforestation were identified<sup>11</sup>.

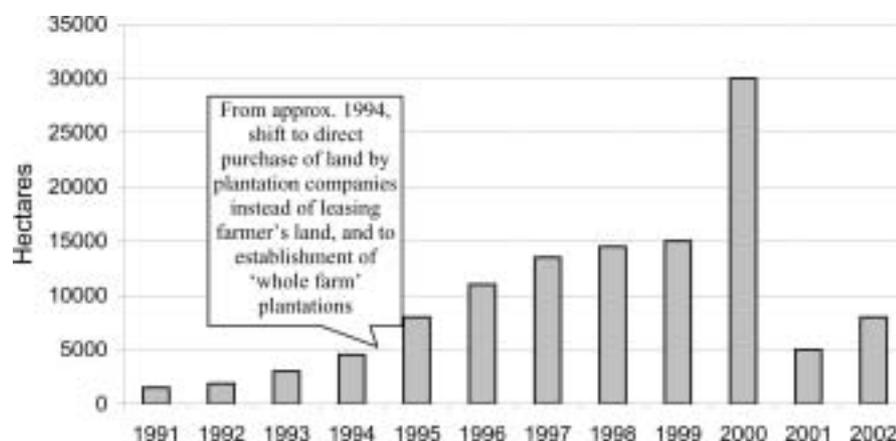


FIGURE 2: AFFORESTATION IN THE GREAT SOUTHERN REGION OF WA, 1991 TO 2002  
Sources: Timber 2002 (2002)

The first analysis, examining views of interviewees, supported the common belief that small-scale afforestation is less commonly associated with conflict than large-scale afforestation. Over half of all interviewees, when asked about factors affecting levels of conflict, stated without prompting that the scale of afforestation affected the scale and intensity of conflict that occurred over afforestation. These included interviewees representing the full range of views about plantations, from highly positive to highly negative. All of these interviewees agreed that small-scale afforestation was encouraged by most of those who criticised large-scale afforestation, and as a result tended to be less associated with conflict over afforestation. Other interviewees when prompted agreed with these views; no interviewees expressed dissenting perceptions.

The second analysis of terminology further supported the theory that small-scale forestry is generally not associated with social conflict. Figures 3 and 4 show the number of articles utilising terms relating to different types of tree planting in the two case study regions. Reports of conflict over afforestation were almost exclusively associated with terminology used to describe large-scale afforestation, while articles, documents and interview respondents discussing small-scale afforestation did not refer to it in association with discussion of conflict over afforestation.

When different topics of conflict were examined, however, some topics of conflict were identified that occurred across both small- and large-scale forms of afforestation, while others only occurred over large-scale afforestation.

Concerns over the social impacts of afforestation were exclusively associated with large-scale afforestation in both case study regions:

*Farmers, consultants and businesses are warning of the potentially devastating social and economic consequences of whole-farm tree planting in the region. (Coatney 1997: 1,2)*

*It has long been the policy of the Albany Zone of WAFF [WA Farmers Federation] ... that tree farming integrated with conventional farming and grazing land had much merit and little downside, whereas "whole farm" or "horizon to horizon" plantings of single species of trees, has many disadvantages (both social and commercial) ... (Davies 1998: 6)*

*Eighty percent of all afforestation in County Leitrim since 1990 has been carried out by Coillte, the State backed forestry company and other non-farmers, Mr John Winters, Chairman Leitrim IFA has claimed in a statement slamming the Minister for Agriculture for allowing Coillte to "swallow*

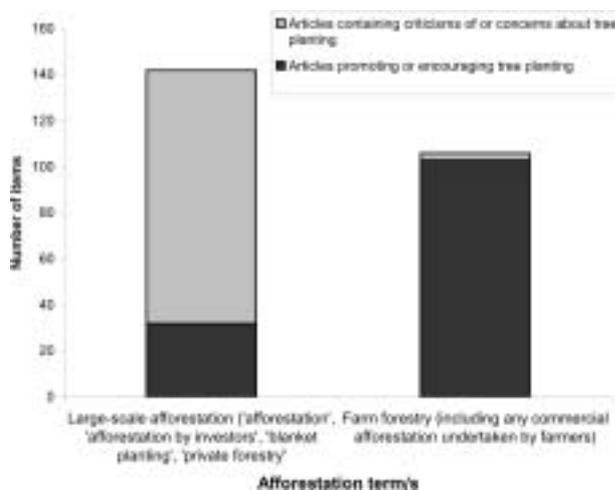


FIGURE 3: COMPARISON OF ITEMS REFERRING TO DIFFERENT TYPES OF TREE PLANTING IN THE LEITRIM OBSERVER 1998 TO 2000

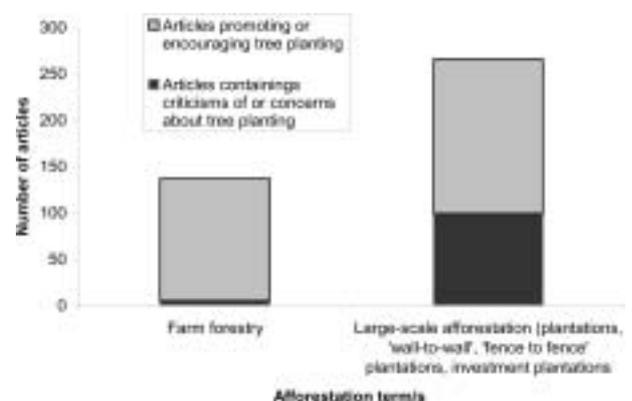


FIGURE 4: COMPARISON OF ITEMS REFERRING TO DIFFERENT TYPES OF TREE PLANTING IN THE ALBANY ADVERTISER 1988 TO 03/2002

*up” huge amounts of farmland for forestry. “... IFA is demanding that the Minister ensures that if forestry is to take place in an area that it is not to the detriment of local people”, said Mr Winters. (LO 24/7/96: 5)*

Additionally, in both case study regions conflicts related to differing perceptions of social impact tended to occur less during those times when small-scale afforestation dominated new plantings.

Concerns over environmental impacts of afforestation, however, were not exclusively linked to large-scale afforestation. In both case study regions, examples were identified where concerns had been raised by ENGOs about the environmental impacts of small-scale afforestation – for example, in the WA case study a dispute arose over the environmental impacts of the establishment of a share-farm in the late 1980s. In addition, the language used by ENGOs when criticising environmental impacts of plantations often referred to afforestation in general, rather than singling out particular forms or ownership of afforestation:

*Environmentalist groups are becoming increasingly vocal over the steady encroachment of sombre blocks of Sitka spruce on the Irish countryside, and are demanding that a greater variety of tree species be planted and that planning controls be introduced for new plantations. (Coone 25/05/1994: 4)*

However, some of the literature produced by those criticising the environmental impacts of plantations tended to use terms associated with large-scale afforestation - even when referring to plantations that might be classified as farm forests. Additionally, many ENGOs actively supported development of small-scale forestry, as the following quote from a WA Conservation Council representative in the WA case study demonstrates:

*We give cautious support for properly done plantations, which are integrated with traditional farming ... We support alley farming for example, rather than fence to fence plantations, plus a move towards mixed species ... (Farmers Weekly 2000)*

The results presented above show that, with the exception of some conflict over environmental impacts of plantations, expansion of small-scale afforestation was associated with considerably less conflict than the expansion of large-scale afforestation in both the case study regions. Potential explanations for this are discussed below.

## DISCUSSION

Both the literature and data from two case study regions support the argument that small-scale afforestation is associated with considerably less conflict than large-scale afforestation. The next obvious question is to ask why this is the case. What aspects of small-scale afforestation make it less contentious than large-scale afforestation?

The results of this study indicate that the scale of ownership of plantations, more than the physical scale of individual plantations, may explain differences in levels of conflict.

Afforestation undertaken on land owned by farmers was consistently associated with positive perceptions in both case study region. This appeared to be the case even where the area of plantation established by a farmer was as large as an area of plantation typically established by a non-farmer such as a government agency or private company.

In the WA case study region, it was common for plantation companies to enter into sharefarming arrangement with farmers, establishing a plantation on part or all of the farmer’s property. Although involving considerable activity by the plantation company in establishing and managing the plantation, this form of afforestation was less commonly associated with conflict than the outright purchase of a property by an afforestation company. Similarly in Co Leitrim, it has become common for plantation companies to be contracted by farmers to undertake many plantation establishment and management activities on the farmer’s land – but it is again relatively uncommon for this to be associated with conflict over afforestation, whereas direct purchase of land by afforestation companies is still associated with concern.

In interviews conducted for the study, three key explanations were given for the preference for farmer-controlled (“small-scale” versus non-farmer controlled (“large-scale”) afforestation:

- Most people described farmer-controlled afforestation as involving the establishment of only a proportion of a property to trees, with the remainder of the property still used for traditional agriculture. This was believed to involve less disruption of rural social and economic relations than the afforestation of entire farming properties;
- Ownership of rural land by private corporations was associated in critics’ views with depopulation of the countryside, and a shift from family-based land management to depersonalised, factory-like productive use of land; and
- Three critics of afforestation reported that they did hold some concerns about afforestation undertaken by farmers, but generally chose not to express them publicly, for two reasons. Firstly, they felt that farmer-based afforestation had fewer negative impacts than non-farmer afforestation. Secondly, each felt they couldn’t criticise people, who they often knew personally, for doing something which might benefit them financially and assist them in staying on the land.

The importance of land ownership remaining in the hands of farmers appears central to explaining the difference in conflict over small and large-scale afforestation, although the physical scale of plantations does appear to play a role as well. This emphasis on ownership appears to reflect the common cultural conceptualisation of rural landscapes as ‘belonging’ to farmers, and the ways in which power relations in rural communities have for many generations have been structured around traditional agriculture. Large-scale afforestation challenges many of the cultural norms held in and for rural regions, particularly through shifting control of land to organisations which interact with rural land in different ways to what is considered the ‘traditional’ farm family.

The rural ideal of a landscape managed by farming families, with each family living on the property they manage, is being challenged on a range of fronts in both case study region - and

certainly not only by the expansion of large-scale afforestation. In both Ireland and Western Australia, farmers have had to continually improve the scale and efficiency of their agricultural enterprises in recent decades in order to remain viable. This has often involved farmers purchasing additional properties to expand their farm. This shift has led to a rapid decline in the total number of farmers in both case study regions. In both regions, farming families increasingly earn off-farm income, and many farmers are ‘part-time’, earning an income in a job off-farm as well as maintaining a farm enterprise. New residents are shifting into rural regions to live on what are often termed ‘lifestyle’ properties (Western Development Commission 2004, Schirmer et al. 2005).

These ongoing changes have led to the argument that the family farm-based rural economy is a thing of the past. However, the challenges to this ideal are strongly resisted on many fronts – one of which is demonstrated in the conflict that occurs over large-scale afforestation.

Other explanations may also be identified for the lack of conflict over small-scale afforestation, including aesthetic preferences for viewing landscapes in which plantations are integrated with traditional agricultural activities. However, the discourses identified in this study suggest that the preference for farmer control of land is deeply embedded as a cultural norm in both case study regions - to the extent that many critics of large-scale afforestation believed there was no need to explain why small-scale, farmer-based forestry was preferable to large-scale forestry, and found it difficult to detail why they had this preference in interviews conducted for the study.

## CONCLUSION

The results of this study support the argument that small-scale afforestation is less commonly associated with social conflict than large-scale afforestation. However, the results also demonstrate the importance of defining the characteristics used to distinguish between small and large-scale afforestation. When the discourses associated with afforestation in the two case study regions of Co Leitrim and the Great Southern

region of WA were examined, it emerged that in both regions small-scale afforestation was identified with afforestation undertaken by farmers, while large-scale afforestation was identified with non-farmers. The physical scale of individual plantations was less important than the scale of the entity that owned the land being afforested. The distinction based on ownership suggests that conflict over large-scale afforestation may be in part a result of the multiple changes to social and economic relations occurring in the two regions studied, which are both experiencing decline in traditional family farming and shifts to new forms of land management.

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## Notes

- 1 While the world's estimated 186.73 million hectares of plantations constituted only 5% of global forest cover in 2000, they supplied an estimated 35% of global roundwood supplies, forecast to rise to 44% by 2020 (FAO 2001).
- 2 The comparability issues are due to differences in definitions used by the FAO when gathering data about plantations at different times (FAO 2001).
- 3 The FAO (2001) defined plantations as: 'Forest stands established by planting or/and seeding in the process of afforestation or reforestation. They are either: (i) of introduced species (all planted stands), or (ii) intensively managed stands of indigenous species, which meet all the following criteria: one or two species at plantation, even age class, regular spacing.'

- 4 Concerns and conflict have been documented in nations and regions including Argentina, Australia, Bolivia, Brazil, Cambodia, Cameroon, Chile, Colombia, Ecuador, Ethiopia, Finland, India, Indonesia, Israel, Italy, Kenya, Laos, Malaysia, Mexico, Netherlands, New Zealand, Nigeria, Noumea, Palestine, Paraguay, Portugal, Republic of Ireland, Senegal, South Africa, Spain, Tanzania, Thailand, United Kingdom, United States of America, Uruguay, Venezuela, Vietnam (see for example Friends of the Earth n.d., Le Heron and Roche 1985, Lowe et al. 1986, Tompkins 1986, Mather and Murray 1988, Neeson 1991, Cohen 1993, Groome 1993, Lara and Veblen 1993, Pereira 1993, Christensen 1994, Marchak 1995, Selby and Petajisto 1995, Carrere and Lohmann 1996, Robbins 1998, Spinelli 1998, WRM 1999, Garcia Perez and Groome 2000, Linnard 2000, Williams 2000, Elands and Wiersum 2001, Tewari 2001, Tonts et al. 2001, Wilkinson and Drielsma 2001, FAO 2002, Lang 2002, Schirmer 2002, Barlow and Cocklin 2003, Cossalter and Pye-Smith 2003).
- 5 For detailed descriptions of key topics over which conflict typically occurs, see FAO (2002) and Cossalter and Pye-Smith (2003).
- 6 Note that while small-scale and large-scale afforestation are often argued to have different social impacts, some recent research suggests that large-scale afforestation in Australia has not been associated with an increased rate of loss of rural population or employment in rural areas (Schirmer et al. 2005a,b). It is important to emphasise that the impacts discussed in this paper (both positive and negative) are perceived impacts, and no attempt is made in this document to assess the validity of the differing perceptions held by different groups about the positive and negative impacts of plantations.
- 7 Definitions of the terms 'concern' and 'dispute' are given below.
- 8 Sufficient similarity was defined as similarity in institutional systems, including government, private sector and non-governmental organisation structures.
- 9 See Australian Forest Growers (2000) for more detail on these changes.
- 10 While data is available identifying whether plantations are publicly or privately owned, this is of little use as almost all plantations in the Great Southern are privately owned (most of the plantations established by CALM were established by the government agency on behalf of Japanese investors, and hence the plantations are privately owned by those investors).
- 11 A fourth approach was also utilised, in which the overall intensity of conflict as measured by intensity of media reporting was recorded and compared to the scale of afforestation occurring. However, this approach was difficult to utilise as the shift to small- or large- scale afforestation in each case study region typically occurred at the same time as a range of other changes which are equally likely to have influenced the path of conflict over afforestation, while the first three approaches allowed more meaningful identification of the influence of the scale of afforestation.