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Policy tools to encourage farm afforestation in Ireland

Keywords: Farmer; afforestation; decision-making; Ireland; rural development; multifunctionality; policy-tools

Abstract

To encourage Irish farmers to afforest agricultural land, a premium scheme supporting such planting was implemented in 1989 and afforestation targets outlined in 1996. In the period from 1996 to 2009, however, only half of the targeted area was planted although the income of many farmers would have improved on joining the scheme. A multi-method study was undertaken looking at farmers' decision-making with regard to afforestation under the scheme. In this paper we focus on one particular element of the study, which is about identifying policy tools that best match farmers' behaviour with regard to afforestation. Based on previous work, which we undertook on farmers' goals and values with regard to afforestation and was presented in this journal, a postal survey was designed and distributed in spring 2012 to farmers all over Ireland. The results indicate that the majority of those surveyed do not make their decision to afforest based on profit maximisation goals. Offering only an incentive tool – such as the current premium scheme – will not be sufficient to encourage those farmers to plant trees. Additionally capacity tools such as group plantings of neighbouring fields and symbolic tools such as an information and PR- or image-building campaign should be deployed to further encourage afforestation by farmers.

1 Introduction

1.1 Farm afforestation policies in Ireland

In line with other European countries, many rural areas in Ireland struggle with socio-economic problems such as job losses in farming and depopulation. Alternative employment options could be offered by a strong sustainable forestry and wood-processing sector, as the natural conditions in Ireland are very favourable to tree growth (DAFF, 1996, 2010). The mean annual increment is approximately twice as high as that in mainland Europe (Kearney and O'Connor, 1993; Ní Dhubháin and Kavanagh, 2003). Forests, however, cover only approximately 11% of Ireland's land surface, far less than the European average of 40% (EUROSTAT, 2011). This is due to centuries of resource exploitation and expansion of agricultural land-use (Neeson, 1991). Afforestation strategies have played an important role in Irish rural development policies for many decades. Up until the 1980s most of the planting was undertaken by the State. Average private sector planting at that time was less than 100 hectares per year. The first substantial increase in private sector planting followed the introduction of the EEC-funded Western Package Scheme in 1981 to stimulate agricultural development and improve farm incomes in the West of Ireland (O'Carroll, 2004). Farmers afforesting part of their holding could apply for up to 85% of their establishment costs (Ní Dhubháin and Wall, 1999). A nationwide farm afforestation scheme was introduced in 1989 to increase the forest cover and at the same time offer farmers in marginal agricultural areas an additional income opportunity. The scheme fully covered the establishment cost and paid farmers an annual, non-refundable, tax-free premium, which provides them with an income from the time of planting until the first timber harvest is due (Kearney and O'Connor, 1993). Premiums increased significantly after the scheme was transformed into an accompanying measure according to EC regulation 2080/92 (Behan and McQuinn, 2005; Frawley, 1998). The interest in private planting grew dramatically with 17,000 ha of farm land being afforested in 1995 (Forest Service, 2009). A national forestry strategy 'Growing for the Future' was published in 1996, which based its ambitious afforestation targets on these figures, i.e. 25,000 hectares per annum until the year 2000, and 20,000 hectares per annum from 2000 until 2030 (DAFF, 1996). It had been calculated that such a level of afforestation would lead to the amount of timber output necessary for the establishment of a viable wood-processing sector, which would provide new employment opportunities in rural areas (DAFF, 1996, 2010; Irish Government, 2002). The forestry strategy further specified that 70% of the planting was to be carried out by private landowners, in particular farmers (DAFF, 1996). However, after the programme was launched, interest in planting dropped significantly. Between 1996 and 2009, only 48% of the targeted area was planted with trees (Forest Service, 2009) (Figure 1). The Irish Government took a number of actions to increase the attractiveness of the scheme. For example, the premiums increased in 1995, 1999, and 2007 with the minimum premium currently standing at 369 Euros/ha and year (Figure 1). In 2005, the stacking of the Single Farm Payment was allowed, which

meant farmers could continue to receive direct agricultural payments on the afforested land. An additional Forest Environment Protection Scheme (FEPS) was introduced to attract those farmers receiving payments under the Rural Environmental Protection Scheme (REPS). Nevertheless planting rates continued to fall below target and the Department of Agriculture, Fisheries and Food (DAFF, 2010, p. 60) states in its Rural Development Programme for the period from 2007 to 2013 that *‘the major difficulty with the [afforestation] programme at the moment is the low rate of take-up’*.

Insert Figure 1

Figure 1: Private afforestation rates (ha/year) and rate of annually paid farm afforestation premiums (Euros/ha and year) in Ireland 1990-2010. Source: N.N. (1990); Irish Farmers’ Association (1991-1996); Irish Timber Growers Association (1997-2010); Forest Service (2010)

1.2 Farm afforestation and rural development in the EU

In 1992 the EEC introduced its first farm afforestation support policy that was open to all member states.¹ One of its objectives was to address some of the problems that had originated from agricultural overproduction (Council of the EEC, 1992). Due to the surplus output of agricultural products, food prices had declined and farm households struggled to make a living from farming, especially in areas where the natural conditions were less favourable to farming. By supporting the afforestation of agriculturally used land, farmers could be offered income support while at the same time agricultural outputs would be reduced and the negative environmental externalities of agricultural overproduction addressed (Lowe et al., 2002). The EU today continues to support farm afforestation. Its conditions are laid down in Council Regulation 1698/2005 on support for rural development. Member States have the option to pay farmers financial support for the establishment and maintenance of a forest as well as an annual premium (European Commission, 2005). These premiums are co-funded by the European Agricultural Fund for Rural Development (EAFRD) to the level of 55%, or 80% for ‘convergence objective’ areas (ibid).

Supporting farm afforestation not only improves individual farmers’ incomes but it can also have a positive impact on the development of rural economies in general through stimulating the establishment of related services and industries (Ní Dhubhain et al., 2009). Furthermore it has been shown that communities benefit more from locally-owned and managed forests than from large-scale

¹ Before that there were a few regional specific afforestation schemes available, however their objectives were different in that they supported the afforestation of marginal land rather than agriculturally used land. Furthermore, the amount of financial support offered was not as generous.

State or company-based plantations as profits are more likely to remain in the locality (Frawley, 1998; Schirmer, 2007). Also, employment opportunities in large-scale forest industries have declined due to the increased use of machinery and economies of scale (Hytinen et al., 2000).

As highlighted earlier, Ireland and a number of other European countries set up support schemes for farm afforestation under Council Regulation 2080/92 and subsequently under Regulation 1698/2005. Other countries such as Finland and France experienced a similar pattern of farm afforestation uptake to that which occurred in Ireland. After an initial high level of interest, planting rates also dropped in these countries (Mather, 1998; Selby and Petäjistö, 1995). In England and Northern Ireland, participation in afforestation schemes did not meet expectations from the outset (Burton, 1998; Edwards and Guyer, 1992; Ilbery and Kidd, 1992; van Gossum et al., 2008). In the Belgium region of Flanders, despite the implementation of afforestation incentives and restriction on deforestation, forest cover declined before slightly increasing again (van Gossum et al., 2008). Thus, despite the availability of financial incentives for farm afforestation, farmers did not plant as frequently as envisaged and planting rates were volatile in many countries (Edwards and Guyer, 1992; Mather, 1998).

2 Farmer decision-making and policy tools

According to Anthony Giddens' theory of structuration, social practices such as land-use and land-use change are influenced by structure as well as by individual agents' actions (Giddens, 1984). He defines structure as the 'rules' and 'resources' being a condition to a structuration process, but also being the outcome of agents' actions ('duality of structure'). The process of structuration combines both agency and structure, which interact with each other to 'structure' a society or social system (Burton and Wilson, 2006; Giddens, 1984). Similarly, Battershill and Gilg (1997) divided different factors influencing farmer behaviour and decision-making into structural factors and individual farmer factors. Influential structural factors were identified as government policy, financial pressures and family. Values, dispositions and personalities were identified as influential individual farmer factors. Such an approach takes farm and farmer circumstances equally into account when trying to describe farmers' decision-making and behaviour. Clark and Lowe (1992) have pointed out the dominance of 'farmer-free' theories, which neglect the important role of farmers' own ideas and intentions in explaining their decisions. According to Battershill and Gilg (1997) and Burton and Wilson (2006), the 'farmer focus' or endogenous dimension remains overlooked in most agricultural research. In Ireland for example, most attempts to explain the low take-up rates of farm afforestation have focused on the structural context (e. g. economic factors and material resources of the farm) while the influence of individual agents' behaviour has been neglected. However, in order to design successful policies, individuals'

views need to be taken into account. This is particularly important for policies that rely on the voluntary uptake by a large number of people in different situations, such as the Irish farm afforestation scheme (Burton et al., 2008; Morris and Potter, 1995; Wilson, 1997; Wilson and Hart, 2000). As McDonagh et al. (2010) point out the decision to afforest is difficult and for every farmer depends on different factors. According to Schneider and Ingram (1990), individuals can have different reasons for compliance or non-compliance with a policy. In their theory on policy tools, they contend that policies generally are designed to match various decision-making behaviours to the desired policy outcome. Accordingly, individuals of a target population will only co-operate if the employed policy tool matches their decision-making behaviour with regard to the policy's objective. Schneider and Ingram (1990) classified five different types of policy tools according to the type of behaviour they address (Table 1).

Insert Table 1

The Irish afforestation scheme is a typical incentive tool offering external motivation in the form of premium payments. It assumes that farmers make their decision to plant trees based on profit maximisation. This assumption is valid for those farmers who availed of the scheme in the past and planted. If this assumption were also true for those farmers who did not plant, the explanation for the low uptake of the scheme would be that premiums are not attractive enough. However, economic studies have shown that forestry returns would exceed those from farming on poor quality land, namely beef and sheep enterprises (Collier et al., 2002; Duesberg et al., 2008). More recently Breen et al. (2010) showed that the Net Present Values (NPV) of various forestry scenarios are higher even if compared with farming enterprises typically carried out on medium quality land. If all farmers behaved as profit maximisers, agricultural land should have been planted with forestry on a larger scale. However, as Schneider and Ingram (1990, p. 514) point out '*not all decisions or behaviour are driven by objective or tangible payoffs*'. The general literature on farmers' decision-making confirms these findings. There is abundant evidence that farmers' farm management (especially on owner-occupied family farms) is not motivated solely by economic goals (Austin et al., 2001; Battershill and Gilg, 1997; Burton, 1998; Duesberg et al., 2013; Gasson, 1973; McDonagh et al., 2010; Morris and Potter, 1995; Potter and Gasson, 1988; Shucksmith and Herrmann, 2002; Willock et al., 1999). Thus, another explanation for the afforestation scheme's failure to reach its targets could be that a proportion of farmers do not behave as profit maximisers. From previous research we conducted, we know that farmers hold different financial goals such as making a 'Maximum Profit', or a 'Satisfying Profit' or having 'No Interest in Profit (Hobby Farmers)' (Duesberg et al. 2013). However, these goals are not necessarily unchanging. For example Gasson (1973; p. 525) assumed that '*people desire to achieve all*

valued ends, but in situations where these are mutually exclusive, it is the relative ordering of values which determines how they decide to act.’ This would mean that while a farmer in general could pursue profit maximisation goals, this might change when it comes to the decision to afforest. If Irish farmers do not act as profit maximisers when it comes to the afforestation decision, different policy tools will be needed to accompany the current incentive tool to encourage more farmers to plant trees on their land.

Two of the behaviours and their respective tools – presented in Table 1 above – could be considered as potential options to accompany the current incentive tool, namely *capacity tools* and *symbolic tools*. We believe that the incentive tool should continue to be available as almost no farm afforestation took place prior to the introduction of the premium scheme and studies conducted since that time have shown that the vast majority of farmers would not plant if no grants were available (Carroll et al., 2011; Maguire, 2008). Authority tools would not be an option in Ireland as they would direct or command farmers to plant without offering any positive or negative incentive. Applying a tool such as this in conjunction with the incentive tool would not make sense. We also regard learning tools as unsuitable in this instance as they are typically employed where the nature of the problem and the solution to it have yet to be established. In this instance, the Irish Forest Strategy has identified the problem as being a too low forest cover, the main solution to which is to encourage the private afforestation through farmers (DAFF, 1996). While both of these assertions can be questioned, the purpose of this study is not to assess the targets of the strategy itself, but rather to assess if the current policy tool is appropriate to achieve the outlined targets and to suggest alternative tools if necessary.

Hence, the objective of this work is to determine whether it would be necessary to improve the current incentive tool and to determine if additional symbolic and capacity tools need to be employed to encourage more Irish farmers to plant trees on their land. For this purpose we first established whether Irish farmers in general behaved as profit maximisers. Second, we examined whether they behaved as profit maximisers with regard to the actual afforestation decision situation or if their decision to afforest is instead based on symbolic values. Third, we determined if capacity deficiencies need to be addressed in order to encourage afforestation. Lastly, we discuss the implications of the findings in terms of designing more effective policies.

3 Material and Methods

3.1 Research design

A survey was sent out to a sample of farmers all over Ireland to find out which policy tools – incentive, symbolic, capacity – need to be employed to encourage more farmers to afforest (see 3.2 for sampling and study participants). Its objective was to establish the behaviour that underlies a farmer’s decision to afforest and to determine if capacity deficiencies are a barrier to planting. The survey included 19 questions and was based on our previous research related to the goals and values of Irish farmers with regard to afforestation (Duesberg et al. 2013). For that research, we had conducted 62 in-depth interviews to explore the afforestation decision from a farmer’s point of view. The results from that study provided us with the range of potential afforestation behaviours and capacity deficiencies, which are examined in this survey. The survey questionnaire comprised four sections dealing with the following issues:

- A) Profit goals for the farm in general;
- B) Reasons for not planting;
- C) Reasons for planting;
- D) Knowledge about afforestation scheme;
- E) Socio-demographic and farm structure variables.

The objective of section A was to establish what profit goals farmers’ pursue for their farm in general. Presented were three statements representing the profit goals (maximum/satisfying/no profit) identified in our previous work (ibid). Participants were asked to choose the one statement they most agreed with. The selection and phrasing of the three statements was grounded in the data collected for the previous qualitative research. The options presented in the survey were:

‘I look at farming totally from a financial point of view. I reckon the land is there to make as much money as possible.’ (Maximum profit)

‘You would want to make a satisfactory income with farming, all right. But the last penny of profit wouldn’t necessarily be what I’m after.’ (Satisfying profit)

‘The farm is just a hobby really. I’m farming despite the fact that at best it would break even only.’
(Hobby farmer)

The objectives of sections B and C were to establish the types of behaviour that underlie a farmer's decision to afforest, i.e. whether a lack of incentives or symbolic reasons were the main reasons for not planting or planting. In section B, five statements expressing incentive or symbolic reasons for not planting were presented. The selection and phrasing of these statements, too, was grounded in the data collected during the previously conducted in-depth interviews. The options presented in the survey were:

I will not plant because:

'When I do the figures on it, I'm still better off using the land for farming or renting it. I would be losing money if I planted.' (Represents profit maximisation behaviour – Incentives too low)

'I prefer producing food on my land rather than growing trees – even if it is making less profit.' (Represents symbolic barrier – prefers to produce food)

'Forestry is too long-term, you can't change from one year to another like in farming.' (Represents symbolic barrier – prefers land-use flexibility)

'What would I do if I planted trees? I do not think it's really how much money you make out of farming; it's the job satisfaction. There is not much job satisfaction in forestry.' (Represents symbolic barrier – prefers farming lifestyle).

'Earlier generations put a lot of work into felling trees and making this farmland. I'm not going to plant it now.' (Represents symbolic barrier – family tradition, social values)

In section C similar questions were put to those who were interested in afforestation to determine whether their decision to plant is because they believe forestry to be a more profitable option than farming or whether there were symbolic reasons guiding this decision. Four statements were presented in the questionnaire and respondents were asked to indicate which they agree most with. Those statements were also drawn from the in-depth interviews conducted for the previous work on goals and values for farm afforestation. The presented statements were:

I will plant, because:

'With forestry I will earn more money than with farming the land.'

(Represents financial reason – profit maximisation)

'I have really bad land that's good for nothing else and is not producing anything.' (Represents symbolic reason – prefers to produce food on good land)

'I think a forest will be a good asset to have for my successors.'

(Represents symbolic reason – family tradition, social values)

'Creating a forest will contribute to nature conservation and provide habitats for wildlife.'

(Represents symbolic reason – social values)

Sections D and E examined whether capacity deficiencies were barriers to planting. In our own previous research, we had identified three potential capacity deficiencies as being potentially relevant (Duesberg et al. 2013). These were as follows: a lack of knowledge about the scheme; insufficient land and a lack of decision-making skills in terms of accounting and comparing returns from different land-uses. To establish the extent to which a lack of knowledge about the scheme was the main barrier to planting, participants were first asked in Section D if they were interested in planting at the current moment, they were then given detailed information about the afforestation scheme and were then asked if that information had changed their mind in favour of planting. The detailed information provided described all of the financial benefits available more specifically and asked if the participants about their level of knowledge/awareness of the different benefits².

Section E established the extent to which a lack of land or their own decision-making skills were barriers to planting. For this purpose, questions relating to the size of farm and the educational level of the farmers were included in the questionnaire. In terms of the size of the farm, we asked for the size of the land farmed as well as for the size of the land owned to establish the number of hectares to which the participant has property rights in terms of making a long-term land-use-change decision.

Additional general questions relating to the farm enterprise, their location occupation, gender, marital status and family stage were also included.

² See section 1.1 for more information on the afforestation scheme's benefits

3.2 Study participants

The questionnaire for the survey was distributed in spring 2012 to a random sample of 4,000 farmers all over Ireland with the support of the Department of Agriculture, Food and the Marine (DAFM), which administered the mailing. The sample was drawn from a list of 136,000 recipients of Direct Payments (Single Payment Scheme and other schemes), which represented 97% of the farming population.³ Tables 2 and 3 give an overview over the respondents' characteristics.

Insert Table 2

Insert Table 3

The survey had a relatively high response rate of 38%. Other postal surveys sent out to farmers typically achieve response rates between 10 and 25 % (Garforth and Rehman, 2005; Jongeneel et al., 2008; Kassioumis et al., 2004). The high response rate is even more notable as the questionnaire was sent out in spring, which usually is a busy time of the year for all farmers. An explanation could be the fact that the mailing was recognisably sent out by the Department of Agriculture. Also the relative compactness of the questionnaire, which comprised only four pages, might have been to our advantage. Additionally it could have been interesting for the participants to read the sections that contained farmers' typical statements about farming values and reasons for planting and not planting.

For data administration and analysis SPSS software was used. Chi-square tests were carried out to explore relationships between the reasons for not planting and non-numeric variables like profit goals, farm structure variables and socio-demographic variables. A one-way ANOVA test was employed to determine whether the average farm size was differed significantly according to reasons given for not planting.

4 Results

Results are presented to determine which of the three identified optional policy tools – incentive, symbolic or capacity – are appropriate to encourage more Irish farmers to plant trees on their land. First, we explore if the current incentive tool is generally appropriate and if premiums need to be increased to encourage more farmers to afforest. For this purpose we look at farmers' financial goals

³ According to the most recent Census of Agriculture conducted in 2010 there are almost 140,000 farms in Ireland. No information is available about those farms not receiving direct payments.

for the farm. Second we look at the role financial goals and symbolic values play in the afforestation decision. Third we look at capacity deficiencies in terms of a lack of knowledge about the scheme, insufficient land, and a lack of decision-making skills. The discussion section explores the implications of the findings for policy making.

4.1 General financial goals

The majority of participants were looking only for a ‘satisfying profit’ rather than for the maximum profit (Table 4). Almost a quarter of farmers indicated that farming was only a hobby (*‘I’m farming despite the fact that at best it would break even only.’*). Similarly, Meredith and McCarthy (2012) found that the majority of Irish farmers regard farming as a way of life rather than as a business enterprise.

Insert Table 4

4.2 The role of incentives and symbolic reasons in the afforestation decision

Of the survey participants, only 10 % currently considered to availing of the afforestation scheme and plant trees on their land. When asked for the reasons for their lack of interest in planting, only a minority (13%) expressed the view that it was because of a lack of incentives (Table 5). For the majority of respondents, the barrier to joining the afforestation scheme was of non-monetary, symbolic nature. More than one third stated they would prefer to produce food, *‘even if it was making less profit’* – as it was phrased in the questionnaire. A quarter did not want to give up the flexibility of land-use choice. The rest either wanted to continue farming for social or lifestyle reasons (Table 5).

Insert Table 5

Interestingly a number of farmers exhibited different decision-making behaviours for the farm in general and for the specific afforestation decision. While 26% of participants indicated the pursuit of maximum profit as a general financial goal for the farm, only 13% of participants would base their decision to afforest on profit maximisation goals. This confirms Gasson’s (1973) assumption that the ordering of values can change in differing decision-making situations.

Linking the reasons for not planting with the general profit goals showed that profit maximisers were more likely not to plant because of a lack of incentives (Table 6). Nevertheless almost three quarters of

profit maximisers would not plant because of non-monetary reasons. Hobby farmers on the other hand were less likely not to plant because of a lack of incentives (Table 6). The majority of them either preferred to produce food or the flexibility of traditional farming as opposed to forestry (Table 6).

Insert Table 6

Furthermore we analysed if enterprise type, socio-demographic variables and farm size are related to the reasons for not planting as such relationships could have an impact on designing alternative policy tools (Tables 7 and 8). Tillage and dairy farmers were more likely not to plant because of the incentives being too low (Table 7). Drystock farmers (cattle, sheep, mixed cattle and sheep) were more likely not to plant because of lifestyle and tradition (Table 7). Mixed tillage and grazing farmers ranked somewhere in between. They were more likely not to plant because of incentives than Drystock farmers, but also more likely not to plant because of tradition compared to tillage and dairy farmers.

In terms of occupation, full-time farmers were more likely not to plant because of lack of incentives (Table 7). Farmers with part-time off-farm jobs were more likely not to plant for lifestyle reasons. With regard to education levels, those with vocational agricultural training were more likely not to plant because of low incentives (Table 7). There were a higher percentage of those with trade-based qualification who do not plant because of the lifestyle related to farming. There was no relationship identified between the reasons for not planting and other socio-demographic variables.

Insert Table 7

Those who would not plant because the incentives were too low on average owned or farmed more land than those who gave other reasons (Table 8). This is probably related to the fact that the farmers most likely not to plant due to low incentives were dairy and tillage farmers (Table 7). The area of dairy and tillage farms in general is greater than the overall average farm size (CSO, 2012).

Insert Table 8

Reasons for planting

In the questionnaire we also asked those farmers who were interested in afforesting land about their reasons for being so inclined. The least important reason for planting was because it was more profitable than agricultural land-use. The majority would plant because 'bad land' was available, which usually is land that cannot be used for the actual farming enterprise (Table 9). The second most-often

mentioned reason for planting was that a forest would be a good asset for the family in the future. About one quarter would plant because of a forest's contribution to nature conservation and habitat provision for wildlife. No significant relationships between the reasons for not planting and farm and socio-demographic variables were found.

Insert Table 9

4.3 Lack of capacity

Lack of knowledge about the scheme

Most of the survey participants were aware that the farm afforestation scheme was in operation in Ireland. Initially, only a minority currently considered planting (Table 10).

Insert Table 10

However when given details of the scheme the percentage interested in planting rose from 10% to 26%. Interestingly, many of those (93%) who changed their minds having been given details of the scheme had previously indicated that they were aware of the scheme, indicating that the scheme in general is well enough known.

Lack of Land

The minimum area to be planted under the scheme is 0.25 ha. Only 4% of participants owned less than 0.25 ha. Thus formally a lack of land is only for a few respondents a barrier to planting. However, in the long-term and from a forestry perspective 'postage-stamp'-sized forests are not commercially viable. Farrelly (2007) points out that the average size of an Irish farm forest – which is about 9 ha – is too small to be of economic interest for forestry companies and sawmills when it comes to thinning and harvesting, especially in remote areas. From previous discussion with farmers, we also know that some forestry companies do not recommend planting plots below 20 ha. The latest Census of Agriculture showed that about one quarter of Irish farms are below 20 hectares of size (CSO, 2012).

Lack of Decision-making skills

From the literature we know that forestry is the more profitable option when compared to drystock farming such as non-dairy cattle and sheep enterprises (Breen et al., 2010; Collier et al., 2002; Duesberg et al., 2008). However, in the previously conducted qualitative interviews a number of drystock farmers had claimed the lower profitability of afforesting to be their reason for not planting.

This raises the question whether those farmers based their conclusion on wrongly calculated farm return figures. If that were the case a lack of farm accountancy skills would be the barrier to planting. In the survey 10 % of drystock farmers indicated that they would not plant because farming was more profitable than forestry. To establish whether for this small proportion of drystock farmers a lack of farm accountancy skills played a role as a barrier to planting, we compared drystock farmers' education levels with those of other farmers. More specifically we examined if they had availed of agricultural training courses in the past. The comparison revealed that significantly fewer drystock farmers had availed of agricultural training compared to dairy and tillage farmers (Table 11). This means that potentially a lack of decision-making skills could be a barrier to farm afforestation, however only for a small proportion of the farming community.

Insert Table 11

5 Discussion and Conclusion

The Irish farm afforestation scheme is a typical incentive tool. Such a tool is based on the assumption that the target population will co-operate because it responds positively to incentives. In general, only 26 % of respondents indicated that they make their farming decisions based on profit maximisation. This number was even lower (13%) when it came to the concrete situation of deciding whether to afforest or not. In the survey, 87% of respondents gave reasons other than that of premiums being too low as an explanation for not planting. Correspondingly the least important reason to plant for those interested in afforesting was the higher profit of afforesting when compared to farming. The fact that only a minority of farmers would act based on profit maximisation goals when it comes to afforestation could explain why the planting rates for the Irish farm afforestation scheme have not been as high as expected.

Although the majority of farmers do not respond to the incentive, it will have to stay active, as without premiums being available it is unlikely that any planting would take place – as was the case in the past (Carroll et al., 2011; Maguire, 2008). Furthermore one objective of the farm afforestation scheme is to offer farmers alternative income options. Thus to encourage more farmers to plant alternative policy tools need to be employed in addition to the current incentive tool. To find out which tool or mix of tools will have to accompany the incentive tool we need to look at farmers' most prevalent reasons for not planting. The most often mentioned non-monetary reason for not planting was the preference for producing food, *'even if it is making less profit than forestry'* (as the statement was phrased in the questionnaire). These respondents value food more highly than timber. Correspondingly, most farmers

who would plant would do so because they had bad land *‘that is good for nothing else’*. Bad land typically is land that cannot be used for the main enterprises that the rest of the farm is used for (Duesberg et al., 2013). McDonagh et al. (2010) point out the strong agricultural heritage that is connected to traditional animal or crop production and that forestry is typically associated with marginal and less productive lands. Furthermore they contend that the historical legacy of clearing trees to create ‘productive’ lands is still prominent among Irish farmers (ibid). Similarly, in a study undertaken in Scotland, farmers said they liked trees but only ‘in the right place’, which was on land not suitable for agricultural use (Clark and Johnson, 1993). The fact that only bad land is considered for planting forestry leads to the conclusion that ‘good’ land should be kept for the current land-use, typically food production. Thus, these farmers, too, value ‘Producing food’ more highly than ‘Producing timber’. Replacing food with trees is not in line with their value system. To encourage farmers who value food more highly than timber and who would only utilise ‘bad land’ to join the afforestation scheme, a symbolic tool associating forestry with positive values can be employed (Schneider and Ingram 1990). Such a tool for example could be a public relations or image-building campaign demonstrating the utilities of different timber and non-timber goods and pointing out the public goods that would result from an increased forest cover (e.g. for rural development or the environment). Also, a quarter of those respondents who were interested in planting would do so because it *‘will contribute to nature conservation and provide habitats for wildlife.’* This answer was chosen more often as a reason for planting than maximising profit. As nature conservation and wildlife is important to so many farmers who would plant, the potential positive effects of an increased forest cover on nature conservation and wildlife should, too, be utilised in an image campaign.

The second most commonly cited reason for not planting was that *‘forestry is too long-term, you can’t change from one year to another like in farming.’* One could argue that keeping land-use flexible is a strategy to maximise profit over the years and thus farmers who chose this option act as profit maximisers. However, it has to be noted that respondents who chose land-use flexibility as a reason for not planting dismissed the option of not planting because it would mean a loss in money. From the qualitative interviews we know that many farmers expect returns for agricultural goods to develop positively in the coming years. Thus, preferring to keep land-use flexible could be based on these expectations. To encourage those farmers to plant, an information campaign about future opportunities from forest products could be employed (e.g. the increasing need for renewable energy). Also, for those farmers who did plant in the past, the idea that a forest will be a *‘good future asset for the successor’* was the most often mentioned reason. For them, the long-term nature of a forest is an advantage, rather than something negative. Turning the disadvantage of inflexibility into the advantage of a long-term investment could also be part of an information and image campaign to associate

forestry with positive values. The decision not to plant because forestry is inflexible, however, could also be lifestyle related, capturing the fact that farmers enjoy the management work related to adjusting the farm's inputs and outputs to current market situations from year to year. To encourage those and the other 12 % of respondents who directly stated that '*there's not much job satisfaction in forestry*' a symbolic tool would again need to be applied. For example an image campaign could demonstrate how a farmer can get actively involved in establishing and managing his or her own forest and point out interesting work tasks and management activities occurring in forestry.

The social reason for not planting was the third most often mentioned reason. Values such as tradition and family predominate in this decision to refrain from afforesting land. For this group, forestry would need to be associated with positive social values. For example a symbolic tool in the form of an image campaign could highlight a forest's benefits as a family asset as well as for the local community and the wider society. As Slee et al. (2004) point out, forestry can deliver social values and help give places identities, as well as giving people association with those places.

Only 13% of respondents said they would not plant because the incentives are too low. A lack of incentives is more likely to be a barrier to full-time dairy and tillage farmers with agricultural training. Previous research has shown that those enterprises are more profitable when compared to afforestation (Collier et al., 2002; Duesberg et al., 2008). However, dairy and tillage farms are typically of above average size and could avail of the land capacity to plant (CSO, 2012). They could be encouraged to afforest by increasing the premiums – but such increases would need to be significant. They would be also be expensive in the long run and at maximum would activate only 13% of farmers to plant. Additionally it is questionable from the view of rural development and food security if viable commercial farms such as dairy and tillage farms need to be offered income support, especially for land-use change.

As well as a lack of incentives and symbolic reasons, we looked at the following three capacity deficiencies as further potential barriers to a greater uptake of the afforestation scheme: a lack of knowledge about the scheme, a lack of land and a lack of decision-making skills. The data analysis showed that 16 % of respondents could be encouraged to join the afforestation scheme if a lack of information was addressed. In general the majority of respondents were aware of the scheme's availability. Those not aware of the scheme were less likely to change their mind in favour of planting after being informed about it. It was the provision of detailed information to those who already knew about the scheme that increased the number of those being interested in planting. This indicates that an information campaign addressing the specific detail of the scheme – rather than a general awareness-

raising campaign – could activate a ‘passive pool’ of potential planters to cooperate with the currently available incentive tool. Teagasc, the State’s agricultural extension service are currently providing advice and training with regard to farm afforestation and farm forest management. The question is whether this information reaches the correct cohort of farmers. Further research would be needed to examine this issue.

At first glance, a lack of land seems to be a barrier to planting for only a few respondents. The minimum area to be planted under the scheme is 0.25 ha. Only 4% of participants owned less than that. At one level, more smallholder farmers could be encouraged to plant small plots of land with trees. This might increase their income for at least the period of time where premiums are paid. However, in the long-term and from a forestry perspective those ‘postage-stamp’-sized forests are not commercially viable. Encouraging more farmers to plant small plots of land with forestry thus is not advisable from a long-term rural development and forestry perspective. As noted earlier, some forestry companies also do not recommend planting plots of less than 20 ha. One of the objectives of the farm afforestation scheme is to offer farmers the possibility to diversify their businesses, which implies that after planting, active farming should continue (DAFF, 2010). To be able to afforest and continue farming, a farmer would thus need to own at least 30 to 40 ha. The average farm size in Ireland is 33 ha. In the West of Ireland where farming conditions are less favourable and farms would benefit even more from joining the afforestation scheme, it is even smaller at 26 ha (CSO, 2012). In the survey, 48% of farmers owned less than 30 ha and 68% less than 40 ha⁴. Also, those farmers who had planted forest in the past on average owned more land than those without (59 ha versus 39 ha). Thus, on further consideration, a lack of land could in fact be a constraint for quite a number of farms. However, it is particularly farmers with an average or below-average farm size who are in need of additional income support and who thus would benefit from diversifying their business with afforestation. Hence, additional to the current incentive scheme, a capacity tool could be employed that facilitates group plantings of adjacent fields owned by smallholder farmers. This would create larger forests, which in the end would be more beneficial to the individual landowners and to the general development in these areas. Larger forests would also have a higher value for wildlife, nature conservation and recreation. The survey had shown that such small farms were more likely to be run by hobby farmers. This group was more likely not to plant because of non-monetary reasons. Thus, they would also need to be encouraged to plant through the use of a symbolic tool in form of an image-building campaign that associates forests with the positive values as described above.

⁴ We used figures from the survey rather than those from the Census of Agriculture 2010 as it captures farm sizes in classes, the range of which were too wide for our purpose

A lack of decision-making skills in terms of accounting and comparing returns from different land-uses is potentially an issue for those drystock farmers who indicated they would not afforest because premiums are too low. Significantly fewer drystock farmers had completed agricultural training when compared to dairy or tillage farmers. For those not availing of agricultural training, a lack of decision-making skills could be an issue when it comes to the afforestation decision. However, only 10% of the drystock farmers had indicated they would not plant because the premiums were too low and one fifth of those had agricultural training. The vast majority had symbolic reasons as to why they did not want to plant trees on their land. Furthermore, farmers claiming to make the afforestation decision based on profit maximisation were prepared to change their decision-making behaviour after it was demonstrated that forestry would be more profitable. During the previously conducted qualitative interviews farmers also had shown to change the reasoning underlying their decision-making with regard to afforestation. First they would claim not to afforest because profits from forestry were too low, however after being presented with detail information about the financial incentives they admitted forestry would be more profitable. After being informed about the details they exhibited non-monetary reason for not planting (Duesberg et al., 2013). Such a change of decision-making process could also take place with those farmers where a potential lack of decision-skills is addressed. To summarize addressing a lack of decision-making skills would most likely activate only a small percentage of farmers to plant.

Summary of recommended policy tools

Summarising the policy recommendations to encourage more farmers to plant, we can say that increasing the premiums would only activate a minority of farmers who are not in need of income support. In terms of their decisions about afforestation, the majority is influenced by values other than profit maximisation. Symbolic policy tools need to be employed to overcome such non-monetary barriers. These would either demonstrate that the outcome of the policy is consistent with an existent value scheme or use techniques, which associate farm forests with positive images. In the case of the Irish farm afforestation scheme, an image-building campaign could be combined with an information campaign about the monetary benefits of the scheme, which would activate the pool of potential planters. As well as providing information about the scheme's less well-known details, such an information and image campaign would need to highlight the following positive aspects of forestry to farmers: Utilities of various timber and non-timber goods; market outlook for forest products; the positive aspect of a long-term investment such as forestry for the family or successors; benefits of an increased forest cover to the local and wider society (e.g. rural development, amenities, landscape, environmental benefits); enjoyable work tasks in forestry for farmers. Finally, it is suggested that to overcome the issue of the insufficiency of land – which arises from the small average farm size in

605 Ireland – a capacity tool should be designed to facilitate, encourage and support group plantings of
606 neighbouring fields.

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