



NATURAL
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**ADDRESSING THE INTEGRATION
OF FOREST-RELATED
ECOSYSTEM SERVICES INTO
NON-FORESTRY POLICY AREAS
AND SECTORS**

Report Name: Addressing the Integration of Forest-Related Ecosystem Services into Non-Forestry Policy Areas and Sectors

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Abstract

Forestry provides a host of beneficial Ecosystem Services (ES), which can contribute towards a wide range of policy objectives. Although the environmental benefits of forestry are generally acknowledged, particularly in terms of their contribution towards air and water quality and carbon sequestration, it is not known to what extent forestry related ES are noted in other policy areas in Ireland. This study carries out a review of 40 national policy documents across key sectors in Ireland to analyse the potential for forestry ES to contribute towards 7 priority policy areas: health; community development; environment/land use planning; education; transport; foreign aid and culture and sport. An online workshop was also held with representatives across a broad range of national policy areas to identify opportunities towards the greater integration of forestry ES within each sector and potential barriers. This study finds that there is significant potential for forestry ES to contribute further to national policy objectives, particularly in relation to environmental services, transport objectives, educational and community development objectives and health benefits. However, changes to agriculture funding, improved accessibility and greater inter-departmental engagement are required to encourage buy-in from relevant sectors, ensure equality in participation and allow for multi-sector objective achievement.



Introduction

During the past decade, Ecosystem Services (ES), defined by The Millennium Ecosystem Assessment generally as the benefits people derive from nature (Reid et al., 2005), have received considerable attention worldwide, particularly in terms of their application to policy and decision-making (Maes et al., 2012, Perrings et al., 2011, Geneletti et al., 2020, Rosa et al., 2020, Retallack, 2021). The Millennium Ecosystem Assessment categorizes ES into four categories:

- Provisioning services that provide food, fuel, timber, and other goods.
- Regulating and maintenance services that affect climate regulation, flood prevention, the purification of water and air and waste.
- Supporting Services such as soil formation, biodiversity support, habitat provision and nutrient cycling.
- Cultural Services that provide educational, aesthetic, spiritual, tourism, recreational benefits, health benefits and cultural heritage values

Forests can provide a wealth of human welfare services. Forests provide raw materials for food, fuel and shelter and the soil and vegetative cover provided by forests helps to regulate climate and purify air and water (Krieger, 2001, Nowak et al., 2018, Taha, 1996). Trees and forests can help to improve air quality by removing air pollutants (Nowak et al., 2018, Taha, 1996, Nowak et al., 2000, Tiwary et al., 2009). Forests also provide cultural services such as therapeutic or healing services (Rajoo et al., 2020), educational opportunities (Grahm, 1996) community economic development (Nesbitt et al., 2017) and recreation for physical and mental health (Bang et al., 2018).

Forestry Ecosystem Services in Ireland

In Ireland, a number of reports outlining the values of ES in forestry have been published in recent years. A 2013 study found that the economic value of the ES provided by Irish native woodlands was worth between €100 million and €143 million annually with the amenity value of native woodland calculated at €35 million/yr., expenditure from woodlands related tourism at €50 million/yr. and the carbon sequestration value at €8 million/yr. (Bullock and Hawe, 2013).

The Department of Agriculture, Food and the Marine's (DAFM) Forest Programme, published in 2015, highlights the importance of forestry ES. This programme aims to raise awareness about the value of land as a resource for crucial ES and outlines a range of schemes aimed at providing greater ES to protect water quality, soil stability, habitat support, climate change mitigation and enhanced visual amenities (Department of Agriculture, 2015).

Ireland's 3rd National Biodiversity Action Plan contains objectives to conserve and restore biodiversity and ES in forestry, noting the negative impact that forestry-related activities can have on habitats as well as the value of forestry for carbon sequestration, biodiversity, and water protection. This report highlights the need for stakeholder engagement between relevant sectors, including government and forestry to support biodiversity services (Department of Culture Heritage and the Gaeltacht, 2017).

Current forest policy in Ireland acknowledges the importance of ecosystem services and sets

out “to ensure that afforestation, management of existing forests and development of the forest sector are undertaken in a manner that ensures compliance with environmental requirements and objectives and enhances their contribution to the environment and their capacity for the provision of public goods and services.” (Department of Agriculture Food and the Marine, 2014).

While progress is being made within the forestry sector, and also in areas such as nature conservation and water, it is unclear to what extent forest-related ES feature in other national policy areas. Forestry ES may be relevant to other policy areas such as community development, health, transport, land use planning, education, culture and sport and foreign aid, which have growing commitments toward climate change abatement and other sustainability goals (Pobal, 2021, Department of Health, 2019, Department of the Environment Climate and Communications, 2022, Department of Agriculture Food and the Marine, 2020, An Taisce, 2020, The Creative Ireland Programme, 2019, Percival, 2022).

In order to establish the current role of forestry-related ES in national policy objectives, this project carried out a national policy review and held a workshop with representatives from diverse priority policy areas to identify opportunities for greater incorporation of forestry ES and potential barriers that may exist.

Methodology

A review of current Irish national policies was carried out across different sectors to identify objectives where forestry-related ES could play a role, and the degree to which such potential is recognised (if at all). In total 40 policy documents were reviewed across eight key sectors: planning; health; community development; education; transport; arts & culture; sport and local government (see Appendix for full document list). In each policy document, outlined objectives and actions were examined for relevancy to forestry ES (e.g. carbon sequestration, recreation benefits, flood prevention, cultural value etc.) and noted whether or not forestry was outlined as part of the action plan.

Each of these documents were studied to identify relevance to forestry ES within seven priority policy areas: health; community development; environment/land use planning; education; transport; foreign aid and culture and sport.

Relevant objectives and actions within each document were added to an excel file and categorised according to their forestry ES.

Following this, an online workshop was organised with relevant stakeholders from different sectors and priority policy areas to gather data on the relevancy of forestry related ES to specific sector objectives.

This hour-long online workshop entitled “Forestry ecosystem services workshop” was held via Zoom on the 11th of May 2022. 26 participants attended, with 4 moderators from Natural Capital Ireland (NCI).



Table 1: Workshop attendees

Department/ Organisation	No of participants
Clare County Council	1
Coillte	1
Department of Agriculture, Food and the Marine	1
Department of Children, Equality, Disability, Integration and Youth	2
Department of Education	1
Department of Enterprise, Trade and Employment	2
Department of Health	2
Department of Rural and Community Development	1
Department of the Environment, Climate and Communications	3
Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media	4
Department of Transport	2
Office of Public Works	1
Teagasc	1
The Heritage Council	3
UCD	1
Grand Total	26

The first 20 minutes of the workshop consisted of a presentation from NCI on the concept of forest ecosystem services, the project background, policy relevancy and case studies. Three breakout groups were then conducted for 25 minutes, with one NCI moderator in each room. Prior to the breakout room, participants were presented with 4 questions to consider:

1. How might forestry related ES contribute towards your dept./org policy objectives?
2. What opportunities are available within your dept./org to incorporate forestry ES?
3. What are the barriers within your dept./org to the incorporation of forestry ES?
4. What steps can be taken to address barriers?

Results

Policy review summary

In total, 638 actions are contained in the policy documents that may be of relevance to particular forestry ES.

Table 2: Number of actions by priority policy area.

Priority Policy Area	Count of Actions
Environment/ land use planning	376
Culture and sport	111
Education	52
Community development	42
Transport	37
Foreign aid	10
Health	10
Grand Total	638

The following section outlines the policy review summary and workshop discussions by priority policy area.

Results by priority policy area

Environment/Land use planning

33 of the 40 documents analysed contain relevant actions for the environment/land use planning



priority policy area. The majority of these actions relate to regulating and maintenance services such as climate change mitigation, flood prevention and carbon emission reductions and supporting services such as biodiversity and habitat protection. Forestry ES are specifically highlighted in 211 of the 376 total actions in this priority policy area. These actions include biodiversity friendly planting, the protection of existing trees, the development of bioenergy in industrial areas, city and town tree planting and monitoring and the diversification of agriculture into forestry amongst others.

In the workshop discussions, the Department of the Environment, Climate and Communications (DECC) noted that there was a direct link between their department's objectives of reduced emissions and forestry. Forestry is directly important to the department as part of their Land Use, Land-use Change and Forestry (LULUCF) obligations. The importance of high-quality forestry for biodiversity, was also highlighted, as specific species require certain woodland to thrive. Forestry for flood prevention was also of interest to this department.

A Department of Agriculture, Food and the Marine (DAFM) representative noted the potential of forestry for carbon storage, timber displacement of concrete and steel, nutrient buffer zones around freshwater bodies, flood prevention, flood relief and soil structure protection and biodiversity gain. A participant from the Office of Public Works (OPW) also highlighted the land use of forestry in river catchments and their use in managing run off and reducing and delaying flooding events. This is particularly useful for small, more frequent floods.

The OPW also indicated agriculture as a potential barrier to greater development of forestry. They suggested that for the agriculture industry it may be difficult to acknowledge that land planted for forestry would have to remain planted long-term. They also pointed out that there has been a tendency to prioritise quick crop forestry rather than slower growing trees which would be more beneficial for biodiversity. The negative perception of forestry; largely due to monoculture planting; was discussed by a number of participants as a significant inhibitor of forestry establishment. It was noted that many farmers do not like the requirement to replant harvested forest areas as they feel they are losing control of the land. It was felt by some participants that agriculture and forestry have separate approaches and establishing forestry can go against social norms and the leadership of farming organisations. It was discussed that conventional farming has a higher profile than forestry. These negative perceptions are rooted in poor planning decisions. Forestry extraction may also be damaging minor roads in some areas, and this is causing annoyance and disquiet in some local communities. DECC also outlined that there are obstacles around timeframes being too short for farmers to realise any real benefits from planting forests, making it difficult to meet afforestation targets because forestry is competing with other more profitable land uses.

A member from the DECC suggested that providing incentives for farmers to plant forests would help in achieving their departments GHG and LULUCF objectives. A participant from Coillte suggested that payment for forestry ES, the development of forestry buffer zones and redefining what productive land is could all help in breaking barriers.

Other suggestions included the development of a faster system for licencing for large-scale restoration projects due to the current difficulties in getting licences.

DECC suggested that reconnecting fragmented woodlands could help support greater numbers of

species and improve biodiversity. Woodland could also be developed as climate habitat hedgerows. The National Land Use Review was noted by some participants as a very important piece of work for determining national priorities for forest cover, and improved planning related to forestry establishment should follow the principle of right tree in the right place. Improvements in the regulation of forestry establishment based on input from farmers, landowners and other stakeholders could also positively influence the awareness and perception of agroforestry.

Culture and sport

23 of the 40 documents analysed contain relevant actions for the culture and sport priority policy area. The majority of these actions relate to cultural services such as national heritage, tourism and the development of greenways and other recreational facilities. Forestry ES are noted specifically in 25 of the 111 total actions in this priority policy area. These actions include identifying trees of heritage value, the provision of green spaces for recreation, managed forests for tourism, developing heritage trails in forests, promoting the importance of forestry through film and media and neighbourhood planting for recreation and educational purposes.

During the workshop, a member of the Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media (DTCAGSM) engaged in tourism development discussed the link between forests and tourism products and experiences. It was noted that there was an appetite for year-round adventure tourism which forestry could fit into. Increased public engagement in sports was also a priority for this department and forest ES would contribute to this by providing cycling tracks and hiking trails. DTCAGSM also highlighted the work of Failte Ireland, who is currently developing projects in the area of green and sustainable tourism. It was noted that there is an opportunity to develop forestry for sustainable, year-round adventure tourism. Current policy is being reviewed with more of a sustainability focus and opportunity for increased greenways and forest trails.

A participant from the DTCAGSM engaged in sports policy highlighted that although grant funding is provided for certain development (thorough the FAI and IRFU for example) this funding can't be provided to other organisations to enhance sporting activities, such as recreational sports in forests. However, another participant from DTCAGSM noted that capital support provision was available for developing forest ES for recreation and tourism.

Education

12 of the 40 documents analysed contain relevant actions for the education priority policy area. Most of these actions relate to cultural services, namely the incorporation of environmental issues into curricula, raising awareness of environmental issues and the promotion of biodiversity initiatives across primary, secondary and third level education. 20 of the 52 identified actions specifically highlight forestry related ES. These actions include education on deforestation in national curricula, children's exploration of their natural environment and habitats and raising awareness of the importance of forestry and native woodland.

During the workshop, a participant from The Heritage Council noted an increased interest and



awareness in Forest Schooling in the last few years, which could contribute to their Heritage in School Scheme objectives. A member from the Department of Children, Equality, Disability, Integration and Youth (DCEDIY) also indicated interest in forest ES in children's play and recreation activities.

A participant from the Department of Education (DoE) noted that the national curriculum has objectives related to Education for Sustainable Development which forestry could contribute to. A member of the Heritage Council also indicated that accessing permits and transport for children was a barrier to engagement in outdoor activities such as Forest School. A lack of staff resources and accessibility for children with mobility issues and special needs was also highlighted. The DoE also noted that most schools don't have ready access to or can't afford transport to a forest environment, and so allocated funding could help meet these goals.

Community development

19 of the 40 documents analysed contain relevant actions for the community development priority policy area. Most of these actions relate to cultural services such as encouraging engagement in community groups, the provision of community amenities, the importance of heritage for community development and the establishment of community-based biodiversity initiatives. 20 of the 42 acknowledged actions specifically highlight forestry related ES. These actions include the use of forestry for childhood enrichment, local tree planting initiatives, increased awareness of the importance of forestry for local heritage and the provision of forestry as part of local recreational amenities.

During the workshop, a representative from the Department of Rural and Community Development (DRCD) pointed out the amenity value of forests for community groups. The importance of forestry for physical and mental health, education and biodiversity was noted. The potential role of forestry in social inclusion was highlighted. Forestry could have a role in outreach programmes that engage more disadvantaged communities in climate and biodiversity action.

The Department of Enterprise, Trade and Employment (DETE) signified their interest in the potential of forestry for timber construction.

UCD highlighted that lack of access to forestry could be a barrier to greater public engagement, acknowledging that some of the best forests aren't easily accessible.

A representative from Clare County Council highlighted that there is quite a lot of funding available to implement woodland projects and plans. It was noted that this would be the case in most Local Authorities.

Transport

8 of the 40 documents analysed contain relevant actions for the transport priority policy area. Most of these actions relate to cultural services such as the provision of pedestrian and cyclist

greenways for recreation and regulating and maintenance services such as transport solutions that incorporate carbon emission initiatives. 11 of the 37 highlighted actions identify forestry related ES. These actions include public transport corridors that incorporate native species, the protection of native species on rural roads and junctions, native planting along urban streets and native tree and pollinator species planting in car parks.

In the workshop discussion, The Department of Transport (DoT) noted the importance of forestry as a nature-based solution to manage water and run-off from roads and to improve air quality in urban areas. It was noted that there may also be a role for reducing crosswinds along certain roadways.

The DoT also noted the work of the Urban Transport-Related Air Pollution (UTRAP) working group, which is a group established by the DoT and DECC in 2019. This group is developing recommendations to support decreases in NO₂ in urban environments and woodland development could contribute to this. The DoT also indicated that the Department is interested in funding Cycleways and Greenways which could be a way to increase the development of forestry.

It was also highlighted by some participants that the coordination between transport and recreation policies could help deliver better greenway outcomes.

Foreign aid

6 of the 40 documents analysed contain relevant actions for the foreign aid priority policy area. Most of these actions relate to cultural services such as the provision of an attractive environment to encourage enterprise investment, recreational projects for local benefit provision from wind energy developments and the transition of industrial peatlands. 3 of the 10 highlighted actions identify forestry related ES. These actions all relate to engagement with the private sector in planting for Corporate Social Responsibility (CSR).

Although funding for forestry projects was discussed during the workshop, this mainly related to national sports policy funding, DETE interest in investment in forestry for timber construction and local authority funding for woodland projects, rather than any private sector or other foreign investment.

Health

6 of the 40 documents analysed contain relevant actions for the health priority policy area. Most of these actions relate to cultural services such as the provision of recreational areas, increased community connectedness, social prescribing for mental health and the importance of green areas for health benefits. Regulating and maintenance services are also highlighted such as the importance of green infrastructure planning and integrated national Greenways for improved air quality. While the importance of green areas for physical and mental health is noted, forestry is not specifically mentioned in these reports.

In the workshop, a member of the Department of Health (DoH) highlighted the importance of access



to green spaces for health outcomes. Forestry can also have positive impacts on air, noise and can be useful as an amenity for physical activity. A representative from the DoH also noted an ongoing review of research priorities within which forestry related ES will be considered.

A representative from the DRCD acknowledged the importance of forestry for physical and mental health and social inclusion.

The DoH noted that because they are not a policy lead in the area of forestry ES, they do not have the capacity to develop the wider projects required. Their scope of influence would only expand to include small actions, such as planting on hospital sites. They stated their role would be as stakeholder rather than lead in the area.

DECC posed the question of whether diverse broadleaf forests with associated biodiversity benefits would also be more beneficial to the public from a mental health perspective. A member from the Heritage Council agreed that this could be the case and cited the example of Killarney National Park's beautiful native woodland vs less biodiverse Sitka spruce forestry. A representative from the DoH suggested that access to any green space is more important currently than the quality of the green space, but conceded that this should be a priority for future planning.

Discussion

The national policy review conducted in this study indicates that while the ES associated with forestry are acknowledged across a large number of policy documents, the majority of the focus remains on the environmental benefits associated with forestry rather than wider health, education or community benefits. Out of the 40 documents studied, 33 of these contain objectives related to environmental objectives such as climate change mitigation, flood prevention and carbon emission reductions and supporting services such as biodiversity and habitat protection. Although a DAFM representative highlighted the potential of timber to contribute towards the circular economy as a sustainable building material, discussion of the circular economy in the policy documents studied is primarily focussed on waste disposal (Offaly County Council, 2021, Monaghan County Council, 2019, Cork County Council, 2021, Galway County Council, 2021, Government of Ireland, 2020).

Where the potential to contribute towards the circular economy through the provision of sustainable building materials is outlined (Louth County Council, 2021), no specific objectives are highlighted. Elsewhere in Europe, the role of timber in the provision of low carbon affordable housing and in the sustainable construction of buildings is supported through government policies aimed at reducing legislative barriers (Kuzman et al., 2017, Climate- KIC, 2022, Lovell, 2003, Tykkä et al., 2010, Vihemäki et al., 2019).

While the workshop participants spoke in detail about the specific environmental benefits associated with afforestation, it was acknowledged that the agriculture sector represented a significant barrier to development. Participants noted the importance of funding for farmers engaging in afforestation. In Ireland, the Afforestation Scheme provides financial support for landowners to plant trees on areas which have not previously been under forest. Under this scheme, DAFM absorbs the cost of establishing new forests, landowners are paid up to €680 per hectare for each of the first 15 years of the forest and all profits from the management of forests are exempt from income tax (Department of Agriculture Food and the Marine, 2022b). Under the

Agroforestry option of this scheme, support is provided to farmers on land being used for farming allowing owners to graze and cut silage and hay as well as grow trees for timber (Department of Agriculture Food and the Marine, 2022a). Despite this income opportunity, there has been very low uptake of the agroforestry grant scheme, with just 11 farmers receiving payments from 2016-2020 (Harney, 2021). Some of this failure to engage with farmers could be due to the backlog in granting forestry licences (Mahon, 2021), which was acknowledged by participants in the workshop as a barrier. Farmers also have other, potentially more attractive, land management options available to them including leasing or selling land (O'Brien, 2021) and farmers may prefer to retain the flexibility of land use rather than make a long term decision to plant forestry (Ryan et al., 2022). The exclusion of forestry from GLAS (the agri-environmental scheme outlined under the Rural Development Programme 2014-2020), may have also disincentivised farmers (Forest Industries Ireland, 2021).

Studies have found that financial gain may not be the primary motivation for farmers, and the gain in forestry income may not be sufficient to compensate for the loss of agricultural income, perceived reductions in wealth and the loss of utility derived from engaging in agriculture (Ryan et al., 2022, Howley et al., 2012). In acknowledgement of a farmers preference to farm, future afforestation subsidies could be integrated further with farm management incentives under CAP to improve environmental sustainability, counteract some of the negative perception of afforestation and potentially increase forest cover (Ryan et al., 2022, Forest Industries Ireland, 2021).

The cultural and recreational benefits associated with forestry was acknowledged by a number of the workshop participants, particularly in relation to sports and tourism. The value of forestry in tourism in Ireland appears to be reflected in policy and funding, with €1.2 million funding recently announced for the provision of recreation facilities and outdoor tourism in forests (Department of Rural and Community Development, 2021).

It was noted that sport funding in Ireland tends to be channelled towards major sporting organisations. Indeed, of the €73.6 million COVID support provided to the sport sector in 2021, €57 million was provided to the GAA, FAI and IRFU (Department of Tourism Culture Arts Gaeltacht Sports and Media, 2021). In other countries, such as England, earmarked sport funding specifically for forestry-related sporting activities has been provided. The Active Forest pilot programme, created by Forestry Commission England in cooperation with Sport England, aimed to encourage physical activity and a sporting lifestyle for life for those visiting forests in England (O'Brien and Forster, 2017). Engagement with this programme had a particularly positive impact on those that engaged with sport once a month or less, with 49% of this group going on to engage in sporting activities once a week or more. 98% of participants surveyed indicated an interest in engaging with future physical activities and 91% of respondents returned to engage in woodland activities within 3 months (O'Brien and Forster, 2017). It is possible that earmarked funding towards forest sports as well as the current funding allocated to recreational facilities such as walking routes and trails could increase sporting activity in Ireland.

Forestry ES are relevant to many educational objectives, primarily in relation to environmental topics in the national curriculum. While the value of children's engagement with forests was acknowledged by workshop participants, there were numerous identified barriers including accessing permits, funding for transport, access for children with mobility issues and special needs and a lack of staff resources. Children who engage with the outdoors and forests in particular can



benefit in terms of increased confidence, social skills, communication, physical skills and knowledge and understanding (O'Brien and Murray, 2007) as well as high levels of autonomy, competence, and nature connectedness (Egan, 2020). Studies involving children with learning disabilities have demonstrated improvement in participants memory level and sensitivity to natural surroundings (Floresca, 2020) and sensory and visual development (You and Shin, 2019) following engagement with nature and forestry programmes. Forest School activities can be made more accessible to children with mobility issues through the use of wheelchair-accessible paths, adventure playgrounds to suit all abilities, and rope bridges and activities such as zip wires that can be used by children in wheelchairs (Tickwood, 2021). Addressing these financial and administrative barriers could increase engagement with forestry and improve physical, mental and emotional outcomes for children.

The importance of accessibility was also noted in relation to community development. Forestry can provide a host of community development benefits including local sustainable employment, improved food and energy security, reduced cost housing, cultural and heritage activities, improved sense of place and health and wellbeing (Charnley and Poe, 2007, Barlagne et al., 2021). In other countries, like Scotland, community forestry is used as a policy mechanism to revitalise rural, marginalised areas with the aims of boosting employment, providing scenic environments and supporting the provision of affordable housing (Barlagne et al., 2021). In Ireland, Coillte supports community groups and organisations who wish to acquire and develop sites for social purposes (Coillte, 2022) and a large cross-border community forest has been proposed for Derry and Donegal (Bradley, 2021). Greater support for community forestry could have positive outcomes for both local community wellbeing and the level of forest cover in Ireland.

For transport, the focus in the majority of the policy documents relates to the provision of recreational Greenways. This appears to be reflected in policy and funding in Ireland, as an additional €60 million has been allocated to 40 Greenway projects in Ireland in 2022 (Department of Transport, 2021). Discussions in the workshop highlighted additional benefits including the management of run-off from roads and improved air quality in urban areas. Research has found that the human health impact of the pollution removal by trees and forests can be higher in urban rather than rural areas (Nowak et al., 2018, Nowak et al., 2014). In the UK, the All London Green Grid is a policy framework which aims to deliver green infrastructure across London to provide a host of benefits including recreational amenities, reduced flooding, enhanced biodiversity and improved air quality, amongst others (London Government, 2012). A 2015 study indicated that the provision of more urban tree cover has resulted in improved air quality in London, with the value of pollution removal estimated at £126.1 million per annum (Treeconomics London, 2015). The provision of more tree cover in urban areas in Ireland could improve air quality and aid in the policy objectives of the Urban Transport-Related Air Pollution working group (Department of the Environment Climate and Communications, 2022).

Few of the policy documents contained relevant objectives related to foreign aid and forestry related ES, although the potential for tree planting as a Corporate Social Responsibility (CSR) activity is highlighted. For multinationals, the “green credentials” of a country may be a crucial factor in determining willingness to invest, due to net-zero commitments (O'Sullivan, 2020, Percival, 2022). The opportunity to purchase domestic carbon credits is a significant additional benefit of forestry (Hancock, 2022) that is not noted in the policy documents and was not discussed by stakeholders

in the workshop. Bank of Ireland has recently launched a funding scheme for companies to plant native trees and record the environmental and social benefits, including carbon offsetting, to aid with sustainability reporting requirements (Bank of Ireland, 2021). Under this scheme, AXA Ireland has financed the planting of 600,000 native trees by purchasing €2 million worth of credits. Carbon credits can present a significant opportunity to increase forest cover in Ireland and provide an additional stream of income to forest owners, however, several organisations have criticised recent government statements that farmers who have planted forests with state funding do not own the carbon credit and cannot sell them (Donnelly, 2021, Irish Farmers Association, 2021, Carthy, 2021). Finally, although there were limited health objectives related to forestry ES contained in the policy documents, workshop participants discussed the importance of access to forestry for physical and mental health, air quality and noise reduction. A DoH representative identified their department's limited ability to lead in the area of forestry ES for health benefits, a key barrier to greater incorporation of forestry in health objectives. In other countries, such as South Korea, comprehensive policy for providing forest welfare services, including therapy and healing forests, has been created (Dodev et al., 2020) which has lowered the overall medical costs of the country and increased incomes for residents near the forests and for forest owners (Shin et al., 2017).

Conclusion

This study examines the current role of forestry related ES in a wide range of national policy objectives. Forestry ES can contribute towards many of the objectives contained within these documents, particularly in the provision of regulating and maintenance services such as climate change mitigation, flood prevention and carbon emission reductions and supporting services such as biodiversity and habitat protection. The cultural benefits associated with forestry ES are also acknowledged across a broad range of policy objectives including educational benefits, community development, health benefits and recreational and cultural opportunities. Many of these ES result in interdepartmental benefits- air quality improvements have positive environmental and health impacts; children's engagement with forests has positive impacts on educational, health and community development outcomes; recreational forests result in positive impacts on community development, transport and environmental objectives and public health etc. The workshop exercise highlighted key barriers to greater integration of forestry ES across sectors, including opposition from farmers, lack of resources and accessibility and the lack of decision-making abilities for policymakers. In order to ensure buy-in from the agricultural sector, changes to the grant payment system may be required to acknowledge farmer preference to engage in farming and to compensate for environmental benefits rather than production only. Providing the financial and practical means to access forestry ES is crucial for children, particularly those with mobility issues and special needs, and ensures equal opportunities across society. Finally, the integration of forestry ES into a broad spectrum of policy areas requires strong leadership, a science-based approach and interdepartmental engagement.



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Appendix

Table 3: Document by sector and policy area

Document	Sector	Policy area
Aistear: Principles and Themes	Education	Education
Carlow Town Biodiversity Strategy & Action Plan	Local Government	Education
		Environment/ land use planning
Clare Biodiversity Action Plan 2017-2023	Local Government	Community development
		Education
		Environment/ land use planning
Clare County Heritage Plan 2017-2023	Local Government	Community development
		Culture and sport
		Environment/ land use planning
Community Heritage Grant Scheme 2022	Arts & Culture	Environment/ land use planning
County Donegal Heritage Plan Actions	Local Government	Culture and sport
		Education
		Environment/ land use planning
County Kildare Heritage Plan: 2019-2025	Local Government	Community development
		Culture and sport
		Environment/ land use planning
County Longford Heritage Plan 2019-2024	Local Government	Community development
		Culture and sport
		Environment/ land use planning
Department of Rural & Community Development: Statement of Strategy	Community Development	Community development
Draft Cork County Development Plan: 2022-2028	Local Government	Community development
		Culture and sport
		Environment/ land use planning
		Transport

Document	Sector	Policy area
Draft Dublin City Biodiversity Action Plan (2021-2025)	Local Government	Community development
		Environment/ land use planning
Draft Galway County Development Plan: 2022-2028	Local Government	Community development
		Culture and sport
		Environment/ land use planning
		Transport
Draft Kerry County Development Plan: Biodiversity Action Plan 2022-2028	Local Government	Environment/ land use planning
Draft South Dublin Development Plan: 2022-2028	Local Government	Community development
		Culture and sport
		Environment/ land use planning
		Health
		Transport
Dun Laoghaire TREES & URBAN FORESTRY Strategy 2021-31: Pre Draft Consultation	Local Government	Community development
		Culture and sport
		Environment/ land use planning
		Foreign aid
Education for Sustainable Development: A study of opportunities and linkages in the early childhood, primary and post-primary curriculum	Education	Education
Flood Risk Management: Climate Change Sectoral Adaptation Plan (OPW)	Planning	Environment/ land use planning
Framework for Junior Cycle	Education	Education
Healthy Ireland Framework	Health	Environment/ land use planning
		Health
Leitrim Heritage Plan: 2020-2025	Local Government	Community development
		Culture and sport
Limerick Heritage Plan: 2017-2030	Local Government	Environment/ land use planning



Document	Sector	Policy area
Living with Trees South Dublin County Council Tree Management Policy 2021 - 2026	Local Government	Environment/ land use planning
		Culture and sport
Louth County Development Plan 2021-2027	Local Government	Community development
		Culture and sport
		Environment/ land use planning
		Foreign aid
		Health
		Transport
Monaghan Biodiversity And Heritage Strategic Plan 2020 - 2025 Draft For Consultation – March 2020	Local Government	Education
		Culture and sport
Monaghan County Development Plan 2019 - 2025	Local Government	Culture and sport
		Environment/ land use planning
National Curricula: Primary	Education	Education
National Cycle Policy Framework	Transport	Transport
National Development Plan 2018-2027	Planning	Culture and sport
		Environment/ land use planning
	Transport	Transport
National Planning Framework/Project Ireland 2040	Planning	Culture and sport
		Environment/ land use planning
National Planning Framework/Project Ireland 2040	Planning	Health
National Sports Policy 2018-2027	Sport	Culture and sport
Offaly County Development Plan: 2021-2027	Local Government	Community development
		Culture and sport
		Environment/ land use planning
		Foreign aid
		Transport

Document	Sector	Policy area
OPW Statement of Strategy	Arts & Culture	Environment/ land use planning
Programme for Government: Our Shared Future	Planning	Community development
		Culture and sport
		Education
		Environment/ land use planning
		Foreign aid
		Health
Putting People First – Action Programme for Effective Local Government	Community Development	Culture and sport
		Foreign aid
Sharing the Vision: A Mental Health Policy for Everyone	Health	Health
Siolta: The National Quality Framework for Early Childhood Education: User Manual	Education	Community development
		Education
Social Inclusion and Community Activation Programme	Community Development	Community Development
Sustainable, Inclusive and Empowered Communities: 5 year strategy to support the community and voluntary sector 2019-2024	Community Development	Community development
The Forest of Fingal, A Tree Strategy for Fingal	Local Government	Community development
		Environment/ land use planning
		Foreign aid