IRISH AGROFORESTRY FORUM

Submission with regard to the public consultation on proposed interventions for Ireland's CAP Strategic Plan 2023-2027

The Irish Agroforestry Forum (IAF) consists of a diverse group of stakeholders promoting agroforestry and providing training and advice to those interested in establishing agroforestry enterprises.

The IAF welcomes the opportunity to highlight important recommendations concerning the potential of agroforestry systems to significantly support and complement the CAP Strategic Plan (CSP) 2023-2027 and its proposed interventions.

The IAF wishes to outline the pivotal role agroforestry systems can play as solutions for sustainable land use that deliver economic, environmental and social benefits. Such systems can support all objectives as outlined in the CAP Strategic Plan (CSP). Given the unprecedented challenges conveyed in both the IPCC Sixth Assessment Report and the EPA report on the Status of Ireland's Climate, the group contends that there is now an excellent opportunity to ensure agroforestry is positioned as a central element in helping to address such challenges at hand.

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1. The Irish Agroforestry Forum (IAF)

Throughout the island of Ireland, there is an escalating interest in agroforestry. The interest is evident across all land-based sectors, including farming, forestry, horticulture, and organic and environmental sectors. Based on the number of requests our Forum's members received for information on the technical and practical aspects of agroforestry, a clear need has been identified for a dissemination hub, providing information tailored to meet this growing interest in agroforestry. Stakeholders including the National Organic Training Skillnet (NOTS), the Department of Agriculture, Food and the Marine Ireland (DAFM), the Teagasc Forestry Development Department, Leitrim Organic Farmers Co-op, Trees on the Land, the Organic Trust and Queen's University of Belfast have recently formed an agroforestry promotion and support group: the **Irish Agroforestry Forum (IAF)**. The Forum will establish and manage an informative, interactive website, provide input to policymakers and organise such meetings, conferences, training/knowledge transfer events to further its aims. It will also represent Irish interests at the European Agroforestry Federation (EURAF) and bring the benefits from EURAF members' experiences to practitioners in Ireland.

2. Definition of Agroforestry

Agroforestry is a collective name for land-use practices where trees are combined with crops and/or animals *on the same unit of land* and where there are significant ecological or economic interactions between the tree and the agricultural components (Lundgren and Raintree 1982).

Agroforestry is an ancient practice that is widely incorporated into traditional land-use systems globally. The five main agroforestry practices that are recognised in the EU include riparian buffer strips, forest farming, home gardens and silvopastoral and silvoarable systems (Mosqura-Losada et al. 2018).

Silvopasture, where trees are grown in grazed or cut pasture in a regular or varied pattern (see Figure 1) and **silvoarable**, where trees are grown in rows between an arable crop, are, the most common systems and the most relevant to Ireland given that most of the land area is permanent pasture, followed by tillage.

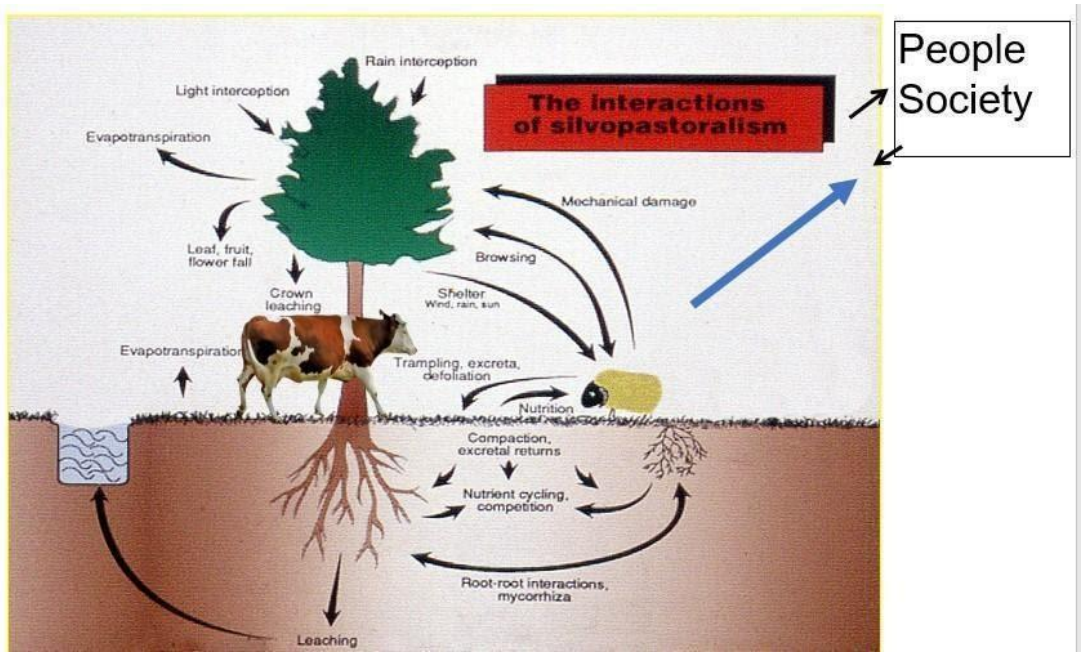

Figure 1: Silvopastoral agroforestry, an integrated multifunctional land-use option delivering a range of ecosystem services.

3. Current issues facing farming and forestry in Ireland

From a sustainability perspective, Irish agriculture faces challenges in key areas: water quality, biodiversity, greenhouse gas (GHG) emissions, tree cover, meeting climate change mitigation obligations, air quality, soil health, ensuring family farm viability and access to markets. Any improvements and delivery of enhancement measures in these areas must be seen against a background of land use capability, financial viability, income security and rural community stability.

Water quality. Eutrophication resulting from excess nutrients (N&P) from farmland is the primary water quality challenge. Approximately 50% of lakes and rivers are of unsatisfactory quality (EPA, 2016).

Biodiversity. Historically, much of Ireland's rich biodiversity has evolved from agricultural land management. However, current farming practices place a series of pressures on the natural environment. These environmental pressures include changes to land use, gaseous emissions, nutrient leakage and losses of agrochemicals from soils to waters, changes to biodiversity impacting flora and fauna and their habitats, and emissions of greenhouse gases (GHGs) and air pollutants such as ammonia (EPA2016).

Greenhouse Gas Emissions. Emissions of GHGs from agriculture in 2017 were 20.2mt CO_{2-} eq, and Teagasc projections for 2030 suggest a figure of 21mt, with a range around this figure depending on how the national bovine herd changes (Teagasc, 2019). Most of these emissions are directly related to livestock farming systems. Reducing GHG emissions is one of the most significant challenges facing agriculture in Ireland. ***Climate change mitigation obligations***. The target for agriculture in the Climate Action Plan is to get emissions between 17.5 - 19mt by 2030, a cut of 10-15% on the projected levels in 2030 relative to 2017.

Tree cover and Forestry. While there is a variation in the metrics and definitions used to quantify hedgerow and non-forest wooded cover in Ireland, overall tree cover is still well below the EU average. In recent years, tree planting has fallen well short of targets. Landowners cite lack of a forest/woodland culture, inflexible support systems, exclusion from other farm environmental schemes and low broadleaf planting targets.

Air quality. Ammonia is a potent air pollutant with significant implications for biodiversity and human health. It is Ireland's most significant air pollutant, with most (c.99%) emissions coming from agriculture. As a result, Ireland fails to meet its commitments under the NEC Directive (NEC, 2018).

Soil health. Soil pH, structure and organic matter are key indicators of soil health. If soil pH is not within the optimum range, most productive plants will not grow to their potential, nor will they respond fully to fertility amendments. If organic matter is low or the soil structure compacted, the soil's capacity to cycle water and nutrients can be greatly diminished, resulting in either excessive leaching or surface runoff, respectively. In semi-natural pastures, soil health needs to be maintained to support the native flora and fauna and prevent a decline in biodiversity.

Family farm viability. Relatively small, family-owned and run farms are the backbone of rural life in Ireland. Many of these are on the margins of financial viability and are seeking ways to conform to future climate challenges and emission control obligations while remaining viable.

Access to markets / Animal Welfare. People are increasingly concerned about the origins of their food and, in particular, the welfare of animals. Growth in the organic retail sector and the increase in vegetarians and vegans is an indicator of this.

4. How agroforestry can address these issues

Current EU policy (evident in Green Deal objectives) promotes sustainable farming practices and policies that address the issues caused by (or issues arising from) previous agricultural practices. Such policies focus on sustainable levels of livestock, tightened nutrient management on farms to improve water quality, healthier soil with enhanced carbon sequestration potential, increased tree cover to contribute to habitat heterogeneity, stabilisation of rural communities, including the family farm structure and enhancement of biodiversity through a more complex, sustainable lower-input agriculture (see section 6).

There is scientific evidence (much of it from the island of Ireland) that introducing wide-spaced trees in designed agroforestry systems can further enhance farmed landscape function (see below). Agroforestry can deliver a wide range of ecosystem services and align and facilitate these sustainable agriculture and forestry land management policies.

From a farming perspective, we very much welcome the expressed this recognition of agroforestry which is also acknowledged in the *Programme for Government - Our Shared Future,* which recognises the need to reward farmers for adapting to more sustainable farming methods through flagship environmental schemes. In the light of the urgent need and challenge to deliver on climate, water quality and biodiversity ambitions, agroforestry must be an integral part of future government programmes and be an important component within the CAP Strategic Plan (see section 6).

Agroforestry has been shown worldwide to have huge potential, including mitigating emissions, enhancing biodiversity, delivering improved soil function and enhancing water cycling associated with having trees spread across and integrated within the landscape. Agroforestry is an ideal measure to help achieve many of the ambitions outlined in the *Green Deal* and *Biodiversity* strategies.

Agroforestry is an ideal mechanism to facilitate all nine specific objectives as described under section 1.3 of the CSP 2023-2027. It also fully meets the requirements on achievement of a higher level of climate and environmental ambition under the 'Green Architecture of the CSP. Section 1.4 indicates that other measures outside of the CAP, such as the provision of national funding under the afforestation programme for alternative land use options such as woodland creation and agroforestry, will combine with the measures set out in the CSP to achieve both Ireland and the EU's environmental and climate objectives.

Water quality. Trees have a proven role in protecting watercourses in riparian buffer zones. However, trees planted in an agroforestry situation improve soil structure across the landscape, allowing the soil to soak and filter water at much larger volumes over a broader area. Tree roots extend well below the understorey roots and absorb any excess nutrients that would otherwise escape into the lower soil horizons and ultimately end up in the groundwater. Additional benefits of root diversity include a greater assortment of soil biology, faster nutrient cycling and reduced soil erosion. Agroforestry gives resilience to grazing operations during extreme rainfall through improved soil permeability. It could also help Ireland meet its obligations under the Nitrates Action Strategy by extending the grazing season [1-3].

Biodiversity. Introducing trees into farming systems creates spatial heterogeneity and soil enrichment, which dramatically enhances the opportunity for a much more comprehensive range of biodiversity

[4, 5], including greater numbers and species of pollinators [6, 7] than would be found under crop or livestock production alone.

Greenhouse gas emissions and climate change mitigation obligations. Research in Northern Ireland has shown that agroforestry systems established with wide-spaced ash in grazed pasture can sequester up to 3.2 t C/ha/yr. If the sequestration potential of hedgerows is added to this, silvopastoral systems can support carbon-neutral beef production at approximately 2 LU/ha. Hence, there is a huge opportunity to offset these by increasing the carbon storage potential from farmland through soils, crops and trees [8]. This will help meet climate change directives and implement mitigation and resilience strategies.

Carbon farming. The recent EU report, *Technical Guidance Handbook – setting up and implementing result-based carbon farming mechanisms in the EU,* highlights agroforestry as one of five 'promising areas' that deliver climate-related benefits and a management practice that benefits soil organic carbon levels. It states the potential contribution of agroforestry to climate change mitigation through restoring and maintaining long-established systems and introducing new agroforestry on arable and grassland farms across the EU. The report describes the multiple benefits, including climate adaptation, biodiversity, soil health, water infiltration and income diversification. It highlights the need for local knowledge and locally appropriate data and monitoring indicators and systems that capture the climate mitigation benefits from increased soil carbon. It also outlines that 'farmers need a great deal of support and advice to participate in these schemes successfully.

Tree cover and Forestry. Outside the definition of commercial forestry plantations, there are existing trees, scrub and hedgerows that are an important part of the rural landscape and yet are not included in the climate credits attributable to tree cover [9]. We support projects that are underway - the *National Hedgerow Survey* and *Farm Carbon Count* - to quantify the distribution and extent of these other trees in the farmed landscape. Agroforestry will facilitate tree planting while still allowing productive farming. Planting should allow a greater diversity of species, uses of trees (e.g. fruit/nut), intra-plot variation, and ecosystem services delivery. There are opportunities for higher broadleaf targets to be met, and together with skilled silvicultural management, agroforestry is well placed to deliver high-quality timber. In this way, agroforestry can contribute to the broadleaf deficit in Ireland and create a resource supply for local sawmills. In turn, this has the potential to strengthen local economies and will increase positivity towards trees and instilling a greater forest and woodland culture into communities.

Air quality. Ninety-two percent of ammonia emitted by livestock is released while they are housed and producing slurry. Agroforestry has been shown to extend the grazing season by up to 15 weeks through improved carrying capacity of the soil and better grassland utilisation. This has a significant positive impact on ammonia emissions. Research is currently underway to measure the amount of nitrogen trees can absorb from the atmosphere through their foliage when slurry is spread and when livestock graze below them, emitting methane and ammonia.

Soil health. The living roots of healthy plants are crucial to soil vitality and nutrient cycling. Maintaining optimum pH, increasing legumes, herbs, and a diversity of grass species broadens the range and depth of rooting zones being utilised. Plant diversity builds soil organic matter and increases microbial diversity, sequesters and retains more carbon in the ground. Trees and woody species add another layer of complexity and root depth to the system, cycling nutrients and building fertility lower in the soil horizon. Also, many agricultural soils lack mycorrhizal and other beneficial fungi. Through symbiosis, mycorrhizal fungi can play a huge role in providing plants with nutrients that

are more difficult to access. Fungal mycelia are also vital for building soil structure and increasing water infiltration. Other fungal species specialise in decomposition, having a role in recycling nutrients from leaf fall and other organic material. Trees widely integrated into the landscape will shift the soil ecology and balance the fungi to bacterial ratio, leading to significant benefits in soil health. Researchers in Ireland have shown that by incorporating agroforestry into a diverse, managed grazing platform, they could help deliver a productive, carbon-neutral livestock system (see reference list).

Family farm viability. Agroforestry is a low entropy measure for restoring healthy soil function and nutrient cycling. These benefits alone will create more resilient, sustainable and profitable farms. Agroforestry systems also deliver multifunctional outputs, potentially creating extra income on the farm through labour and direct sales. There will be opportunities for specialist tree seedling supply from local producers and the promotion of on-farm activities such as agri-tourism and wood product processing which can help people maintain the ability to farm the land. Additionally, agroforestry can positively impact the sustainable landscape and rural development because of the diversity of employment opportunities created by multifunctional systems.

Access to Markets / Animal Welfare. Silvopastoral agroforestry brings real benefits in terms of animal welfare. In silvopastoral systems, animals have access to “browse” or leaf material which broadens their range of diet. Browse can be tailored to address mineral deficiencies in the pasture, adding to the overall health of the livestock. The intimate spatial integration of trees and agriculture provides shelter that reduces wind and temperature stress for animals. Livestock has been shown to spend significantly more time under trees in hot, sunny weather and when it is rainy or windy than in the open. This will become increasingly important as extreme weather events are predicted to become more frequent due to climate change. This combined with the diversity of their surroundings is evidenced as a more welfare-friendly system than when no trees are present. Verifiable welfare credentials and environmental benefits of agroforestry can help meet farm sustainability criteria, enhancing future food marketing and export potential and landowners’ access to markets. For example, in Northern Ireland, the RSPCA ‘Freedom Food’ stamp assures processors that the animals have had access to a percentage of tree cover.

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These benefits will help address climate mitigation and adaptation challenges and deliver a range of other environmental services, including the protection and enhancement of biodiversity and water quality.

There has been an active programme of agroforestry research in Northern Ireland since 1989. This programme was largely driven by the concept of improving grassland sustainability (i.e. from an agricultural perspective) and has shown that silvopastoral systems established in permanent pasture can deliver most of the ecosystem services referred to above. This was highlighted by the strong support for agroforestry practice in the recent Sustainable Agricultural Land Management Strategy for Northern Ireland, adopted by DAERA as policy in 2017.

The productivity of agroforestry systems is often greater than the sum of its parts grown separately. Temperate silvopasture practices improve the productivity of land typically managed separately for pasture or trees by 42–55%, depending on whether the productivity of the pastures is measured by livestock or forage output, respectively [10].

Economic predictions are also encouraging. Studies carried out by the University of Wales at Bangor on the economics of agroforestry compared to pure agriculture or pure forestry, have found that the productivity of a parcel of ground can be increased by up to 50% in some cases. Agroforestry offers farmers the opportunity to continue farming while still growing trees. The diversity of planting and integration models which agroforestry offers can change attitudes to the role of trees within the farmed landscape. There is clear evidence from examples across Europe that the attractiveness and tourism potential of even intensively farmed landscapes can be greatly enhanced by integrating trees in an agroforestry scenario.

The Department of Agriculture, Food and the Marine currently has a measure in its Afforestation Programme (GPC)11 that grant aids eligible landowners to develop their land under agroforestry, while at the same time providing them with a five-year premium. The design and specifications are

primarily geared towards silvopastoral systems, as these have proven successful in Northern Ireland. The grant covers the establishment and early protection of 400 (minimum amount) to 1000 trees per hectare and, while there are clear specifications as to the standard required, there is a certain amount of flexibility in design and approach. For example, in response to demand from the public, fruit and nut trees can be planted.

As there are fewer trees than in conventional forestry, greater attention can be focused on these trees. High pruning and selective thinning have the potential to produce high-value veneer, quality sawlog and renewable energy through firewood. As opposed to quantity, the focus should be on quality. Planting in mixtures should be encouraged although in some scenarios, to reduce the complexity of management, there may be a place for concentration on a single species for a particular purpose. Combinations of short rotation and long rotation species could be planted, ensuring a staggered return on timber production and other objectives through thinning.

5. Barriers to Agroforestry

Whilst there has yet to be a major study on the barriers to adoption of agroforestry in Ireland (some student projects have been/are being carried out), anecdotal evidence suggests the following barriers to uptake of agroforestry:

Agroforestry is a novel and innovative land use in an Irish context, though much international knowledge is available. The lack of agroforestry knowledge amongst farmers and other stakeholders and the lack of expert advice on establishment is a barrier to uptake.

Confusion around payments. Anecdotally many farmers in Ireland surmise that planting agroforestry will result in the loss of BPS farm payments, even though this is not the case. The IAF will support the promotion of agroforestry and strive to educate farmers to further this objective.

Land reclassification. Currently, once land is converted to agroforestry, it is reclassified as forest land and the provisions of forest legislation apply under the Forestry Act 2014. This is another major barrier to the uptake of agroforestry.

Land value. Forested land is typically rated to be of less monetary value than the same land classified as agricultural land, which has obvious implications if it goes for sale or for an owner's ability to acquire finance using the land as capital.

Organic (OFS), GLAS and other area-based payments. The reclassification to forest land precludes the owner from receiving any additional agricultural grants/payments on that land. The change in land classification to forestry means that, under the current rules, farmers cannot receive payments from the Organic Farming Scheme (OFS) or for GLAS or other area-based payment schemes and agri-environment schemes. Anecdotally, based on enquiries received by IAF, there is a strong interest from organic and conventional farmers to establish agroforestry but this is an inhibiting disincentive.

Agroforestry scheme (GPC)11 Vs other afforestation grants. Considering the widespread resistance toward planting trees on farmland, a farmer considering all tree planting options under the stigma of land reclassification is likely to opt for a scheme offering 15 years premiums over the agroforestry scheme which offers only 5 years of annual payments.

Limitations of the current Agroforestry Scheme. The Agroforestry Scheme (GPC)11 was principally designed towards an outcome to yield high-quality sawlogs in a silvopasture setting with a limited range of species. Although there is room for adaptations, the current parameters restrict the full breadth and

potential of outcomes and ecosystem services agroforestry has to offer.

These points are all strong disincentives to planting agroforestry and must be addressed if agroforestry is to fulfil its potential in Ireland.

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6. Proposals to facilitate the introduction of agroforestry into farming and forestry systems

There are two fundamental ways to establish agroforestry, one is to plant trees on open ground and the other is to thin a forested area heavily to enough allow light in to establish an understorey. We see opportunities for both directions to be encouraged on the Island of Ireland.

Agroforestry as a land-use system can incorporate trees in a wide variety of spatial plantings and embrace current geospatial organisation of trees in the farmed and forested landscape – e.g. hedgerows, copses, biomass systems, where these have the agricultural component intimately interwoven through them. Across the world, agroforestry encompasses a wide variety of practices ranging from simple shelter-belts of trees around fields to an intimate integration of food crops and trees e.g. silvopasture, silvoarable, hedgerow, shelterbelts, riparian buffers, forest farming (cultivation within a forest).

Part of the learning curve from applications, plantings and interactions to the scheme to date has been a recognition of different designs and layouts of agroforestry parcels depending on the objectives of the owners. For example, in some cases, poultry farmers require larger numbers of plants than others yet do not have the same specifications for protection.

The following are sectoral based proposals - from agriculture, agri-environment and farm forestry - on how agroforestry schemes could be accessible, flexible, and fit comfortably within any farming context while enhancing farm resilience without negatively affecting production.

The Irish Agroforestry Forum recognises the vital benefit of the protection of forest trees from deforestation provided by the Forestry Act 2014 to maintain permanent forest cover, fixed carbon stock, environmental benefits, etc. However, the Forestry Act was formulated prior to agroforestry being a consideration in Ireland, and as the reclassification of land is a major disincentive:

> *The IAF proposes that trees in agroforestry systems be protected with an amendment to the Forestry Act, or another mechanism that allows for the protection of individual trees without the requirement to reclassify the land. This could perhaps be similar to a Preservation Order. It must not interfere with the standard silvicultural management of the trees (e.g. still allow for thinning, pruning, etc.) and for felling of final crop trees on the condition that equivalent trees be replanted.*

Agroforestry into Farming Systems

Given the nature of the land use, silvopasture has the broadest potential in Ireland. However, tillage lends itself to an agroforestry approach too. Silvoarable systems have been shown to deliver a wide range of ecosystem services which can make them more sustainable and deliver strategic industry objectives. The EU specifies that the related framework definitions for 'arable land', 'permanent crops' and 'permanent grassland' should be set out in a broad way to allow Member States to further specify definitions according to their local conditions. They instruct that the framework definition for 'arable land' should be laid down in a way that allows Member States to cover different production forms, including systems such as agroforestry and arable areas with shrubs and trees and that requires the inclusion of fallow land areas in order to ensure the decoupled nature of the interventions.

To ensure a high uptake, we suggest that any future Agroforestry measure or scheme should consider the following points:

***Remove conflicting penalties**. A major hindrance to developing a biodiverse landscape that leverages the advantages of perennial woody species and trees is excluding areas of scrub and trees from productive land that is eligible for payments. This penalty is a financial burden and exacerbates the current perceptions of the presence of trees on agricultural land. Alleviating this perception is central to the broad acceptance of any scheme to get more trees on the land as such grazed scrub could be regarded as agroforestry.*

***Embracing scrub and natural succession.** Agroforestry establishment tends to focus on newly planted trees, however, a further opportunity for widening the scope, versatility and vision for agroforestry comes through the incorporation of naturally forming scrub and other natural regeneration of trees on open ground. Allowing, for example, a tension between pasture and woodland to develop via scrub areas, maintained with carefully managed grazing, would make a cost-effective and ecologically positive path towards wood pasture, an ancient system and arguably the original silvopasture agroforestry system.*

***Diversity of tree species.** The right tree for the right place. Native trees should be promoted, but a much broader list of tree species, especially those with a supporting body of agroforestry research, should be open to consideration. Worldwide, agroforestry is tailored to the operation whether it be horticulture, poultry production, arable or livestock production. For an agroforestry program to be effective, facilitating this diversity should be core to the design of any scheme.*

***Diversity of function.** We see a dynamic role for trees on farms that can incorporate timber production, biodiversity, carbon sequestration, water cycle quality and security and animal welfare. Using trees in an agroforestry context allows for increased farm incomes from fruit and nut trees and speciality timber production options. Trees for fodder and browse, trees for coppice or long-standing trees, the use of fast-growing trees like poplar and willow for water filtration, and pioneer trees, shelterbelts, short rotation coppice and pollards, trees for creating and linking habitats, riparian woodland for protection and enhancement of water quality (reference Woodland for Water Measure) etc.*

Pro-Rata Approach

A pro-rata approach where the percentage of land planted under the afforestation programme draws the relevant afforestation grants and premiums and is bound by its terms and conditions, while the area in between is eligible for agricultural payments. This idea has been successfully trialled; For areas in excess of 400 trees/ha and requiring a strong silvicultural input, farmers could plant under the current Afforestation Programme. Under each approach a detailed application would be required highlighting short, medium and long term objectives.

Results-based approach if planted under the agriculture measure.

To encourage farmer uptake and deliver value-for-money, one idea is that the programme primarily focuses on a results-based approach. Agroforestry systems that deliver tangible and quantifiable objectives (e.g. in terms of numbers of trees established, simple wildlife indicators, multiple outputs etc.) ideally lend themselves to this approach. This will ensure commitment from the farmer and help break down adverse social perceptions (address reservations) around trees and agriculture.

In this proposal, “the tree” is the underlying metric. How that tree has been established would be a matter of individual choice by the landowner (recognising experience and innovation with supporting advice and training as covered above) and the primary agroforestry payment (Tier 1) should be based on this. The understorey management can be quantified and rewarded under the concept of ecosystem services delivered (qualifying for the second Tier of support). This can be based on simple assessment metrics (e.g. hedgerow length, sward species diversity, simple soil health assessments) and application

of already published metrics on these criteria. For the purposes of the programme, the farmer should be recompensed as follows:

The initial installation payment (Tier 1) should have a set rate per tree (with a quantity ceiling per farm). This payment should cover an average cost of fencing (different costing regarding fencing as required e.g. individual tree fencing vs clusters or rows will incur varying costs). The farmer should be allowed to protect the trees as they see fit. This sum is paid upon completion of planting with a clawback clause if tree survival is below a certain percentage after 5 years, allowing replanting within this period.

Subsequent payments are based on results, i.e. survival rates (and appropriate health/vigour) at annual intervals. These payments should begin low and grow in value as the trees become established – reflecting the value of the trees in the landscape and as positive reinforcement for the farmer's commitment to the care of the trees. This graduated payment would be advantageous on several levels; it would enhance perceptions of trees on agricultural land and act as a rewarding self-policing and commitment mechanism. It is recognised that payments can not be made indefinitely, and a term should be set. However, positive recognition of the range of benefits the trees contribute could be recognised in the form of a carbon credit scheme supplemented by education and encouragement to follow best-practice examples.

Acceptance of the current status that certain soil types and land subject to statutory designation should not be considered for agroforestry planting where they are not aligned with habitat or species objectives.

Participants should have access to a suitably trained agroforestry advisor, be made aware of available research and carry out mandatory training before approval. Support should be given with the provision of a suite of training and up-skilling options.

Agroforestry Into Forestry Systems

Controlled Grazing within existing forests

It is important to recognise that many landowners want to use their existing plantations as productively as possible. Many of these plantations are quite mature and could handle structured grazing incorporating selective timing and adaptive rotational grazing to ensure that fodder resources are available at critical times in their animal's annual nutritional demand cycle. Farmers could be trained to manage and structure their plantations so that grazing could be possible.

The main criticism with this scheme has been the lack of flexibility in planting and protection specifications and the reclassification of land planted in agroforestry as afforested. Support including education and training, should be provided for the controlled introduction of agriculture into existing established forests to manage vegetation as a silvicultural tool. For example, planting trees in groups or permitting grazing in respaced or thinned forests can provide shelter for the animals while at the same time suppressing potential fuel banks for wildfires.

Potential with forests affected by ash dieback

Early examples of agroforestry planting in Ireland focused on ash as the preferred tree species. This was understandable given the trees' suitability, rapid growth, market value, leaf phenology and the nutritional value of the leaves in fodder. Of course, subsequent to the establishment of these plantations ash dieback disease has precluded the planting of ash in grant-aided situations. However, future monitoring will indicate if the grazing sheep removing the leaves in the autumn will afford some protection to the plantation and slow the spread of infection as the fallen leaves are known to be a conduit for the disease.

> *We believe there is huge potential to offer an 'agroforestry transition programme' to those with forest plantations of ash suffering from ash die-back. Where severe thinning of affected trees would allow the establishment of grazable pasture under the trees. While allowing resistant trees to remain as genetic banks in the landscape.*

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Aligning with agri-environment measures

Most agri-environment measures embrace the need to increase tree cover on farmland in some form or other. We urge that the introduction of trees onto farms is supported for as wide a range of spatial planting options as possible - from hedgerows to wide-spaced trees established for timber production and other benefits. This will allow the principle of multiple outputs within goals of sustainability and carbon neutrality to be pursued in as wide a range of farming scenarios. This will also ensure that silvopasture can be used to extend the grazing season to help higher grass utilisation, reduce the period when animals must be housed and hence reduce ammonia emissions and give resilience to grazing during extreme rainfall as the improved soil percolation will minimise potential damage to tree roots or soil structure.

Silvopasture has been shown to increase biodiversity, support more significant numbers and range of pollinators, improve carbon sequestration, support soil structure and health and reduce water runoff when compared to pasture alone. From a welfare perspective, the intimate spatial integration of trees and agriculture reduces wind and temperature stress and provides shelter for animals. There are additional benefits from root differentiation, a reduction in leaching losses of nutrients, faster nutrient cycling in the presence of grazing animals and reduced soil erosion.

The role of hedgerows already sets a precedent for some of the benefits that perennial woody species can play in the landscape. On many farms, hedges perform a similar function as linear woodland strips - they enhance biodiversity, store carbon and afford many welfare benefits to livestock.

Measures incorporating trees on the farm and agroforestry systems have the potential to deliver significant additional ecosystem services in relation to water, carbon and biodiversity. In this regard EU directives (Article 6) state that such measures should be part of a flexible suite of options under

voluntary eco-schemes and agri-environmental schemes and/or Included in a separate eco-scheme supporting trees on the farm.

There is also potential within this article for measures that integrate small areas of trees on the farm and appropriate management that can deliver a range of specific environmental- and climate-related objectives. This would help increase awareness among farmers and provide for greater uptake of measures with multiple environmental benefits. Carefully designed planting of agroforestry on hill farms can mitigate soil erosion and slow water runoff from higher slopes in water catchment areas, reducing the risk of flooding in waterways lower down.

In addition, due to the low fertiliser application, herbicide and cultivation inputs, agroforestry has great potential for planting in acid-sensitive areas or in areas where the freshwater pearl mussel is in danger. The potential of agroforestry as a protective measure has been endorsed by the EPA who allow agroforestry planting to take place in acid-sensitive areas without the need for water sampling. There has been widespread support for the measure by NGOs and environmental lobbyists.

In Northern Ireland, agroforestry is supported as an agri-environment option under the Environmental Farming Scheme (Wider).

7. An overarching strategy for Agroforestry Support in Ireland

Incentives for future support

A strong support programme for tree planting options on the farm and measures that include appropriate agroforestry systems will help enable delivery on many of the ambitions under the *Green Deal* and the *Biodiversity* strategies. Such a programme can help boost the efficient use of resources by moving to a clean, circular economy, restoring biodiversity and enhancing the environment. It will support key national and environmental policies including the recently outlined *Programme for Government – Our Shared Future, FoodWise 2025* objectives, those outlined in Ireland's *Climate Action Plan* (2019), *Project Ireland 2040* among other important national objectives.

The *Programme for Government – Our Shared Future highlights* priorities including 'A new strategy to expand afforestation, particularly *Close to Nature Forestry* and *agroforestry'*. Appropriate farm forest and agroforestry systems will also facilitate the government objective to 'support farmers to embrace farming practices that are beneficial environmentally, have a lower carbon footprint and better utilise and protect natural resources.

Well planned and appropriately managed farm forests and agroforestry systems can help achieve many key CAP objectives. These objectives focus on environmental ambition, transition towards sustainable agriculture and the development of vibrant rural areas. In this regard, it is critical that the new CAP regulations deliver an appropriate framework for the inclusion of strong farm forestry elements in Ireland's *National Strategic Plan* and the development of agricultural schemes under the CAP that contain attractive tree planting options for farmers and landowners.

Agroforestry systems can work in tandem with a range of agricultural systems and deliver a range of benefits for landowners and communities. CAP Regulations must provide the necessary structure and flexibility to allow for the future design of national schemes that support agroforestry and trees on

the farm in conjunction with the other elements of Ireland's agriculture and rural economy. They must allow for the design of agricultural schemes that offer agroforestry and tree planting as attractive options for landowners. Future agri-environmental schemes and other relevant farm schemes should acknowledge and facilitate the wide range of sustainable benefits that can be delivered by agroforestry and trees on the farm and facilitate complementary approaches.

The *Programme for Government – Our Shared Future* highlights the objectives in relation to CAP, including its advocacy 'for a fair system of eligibility conditionality under reform of Good Agricultural and Environmental Condition rules, recognising that farmers should not be unfairly penalised for maintaining land that contributes to biodiversity principles'. In this regard, it is essential that farm forests, including agroforestry systems, must retain their eligibility as crops when determining an applicant's entitlements to the newly proposed *Basic Income Support for Sustainability* (BISS) scheme. Existing qualifying forestry and agroforestry owners should continue to qualify for Direct Payments under the new CAP. It is also imperative that BPS/BISS eligibility for appropriate forest parcel continues beyond the term of forest premium payment. This is to ensure due recognition of the long-term commitment of both land and resources to forest owners towards the delivery of key national objectives surrounding climate change mitigation and societal benefits.

The appropriate integration of trees on the farm can represent an excellent use of available resources from both economic and environmental perspectives. To this extent, the practice of farm forestry should be considered under 'genuine farmer' description, as it is an important on-farm carbon sink and sequestration measure. This will support a greater focus on the environmental benefits that forests and woodlands provide, including biodiversity, water quality and carbon storage and sequestration.

The Government is committed to undertaking a national *Land Use Review*, including farmland, forests, and peatlands, so that optimal land use options inform all relevant government decisions. The review will balance environmental, social, and economic considerations and involve a process of evaluation of the ecological characteristics of the land. It will include consideration of emissions to air and water, carbon sequestration, and climate adaptation challenges. Policy co-benefits, such as rewetting or forest regrowth to mitigate flooding risks in river catchments, will be considered. All stakeholders will be consulted. Such a review would allow knowledge transfer to policymakers, advisory services, and landowners, to assist farmers in making an informed choice as to how best to use their land, while also benefiting from available supports and incentives.

Agroforestry is one option that can deliver these objectives.

Government confirms awareness of agroforestry and affirmation of support

Minister of State at the Department of Agriculture, Food and the Marine, [redacted] stated in a recent interview that the "relatively new practice of agroforestry" is gaining traction in Ireland and could be helped with more supports. She stated that agroforestry could include a broad spectrum of trees - from short-rotation coppice biomass to mature commercial species because the land in between the trees can still be utilised to cut silage and graze animals. She added that if trees were planted appropriately, tillage farming could be practiced as well. She felt that agroforestry created opportunity and that there was scope with a continuous cover model as well … "it would be perceived as a long-term investment on your farm. It delivers for all those other elements of biodiversity. It's a mixed species as well, so you get a variety of plants".

Meeting EU objectives and directives

Appropriate integration of trees on the farm and agroforestry systems can offer significant support towards specific objectives outlined in Article 6**.** These are reflected in the narrative above and embrace activities such as maintaining farm viability through promoting competitive advantage, young farmer empowerment and job creation, food security, animal welfare, sustainable farming and forestry, climate change mitigation and adaptation, contributing to the protection of biodiversity, enhancement of ecosystem services and preservation of habitats and landscapes.

Wider considerations for agroforestry support

There is little history of planted agroforestry in Irish agriculture. Our climate, landscape and cultural history are different from other countries in Europe where agroforestry is part of the agricultural and woodland norm.

Agroforestry research in Northern Ireland and in Ireland has shown that agroforestry can work in a wide range of scenarios with exceptionally positive benefits - many highlighted above. As mentioned above, in Northern Ireland, agroforestry is supported under the RDP within an agri- environment measure - the Environmental Farming Scheme (Wider). Uptake of the scheme has been promising with most interest coming from livestock farmers, however there are drawbacks to the scheme. Although the land remains classified under agriculture, support payments are currently only guaranteed for 5 years and planting and tree protection prescriptions are seen as unduly rigid - as is the case in the South.

While it is clear from experience on the island that agroforestry as a viable, sustainable land use creates a unique set of opportunities, it does not fall directly into either the forestry or agriculture sector. This is reflected in the levels of uptake and drawbacks of the current support measures in operation. However, given the shorter rotations i.e. annual / biannual cropping time and livestock management in agriculture, we feel that agroforestry is very relevant also as a farm support measure. Although agroforestry probably lends itself better to an agricultural or environmental support platform, there are clearly situations where it is suited to a forestry measure.

Agroforestry is a novel land use system to the island of Ireland and as such embraces both agriculture and forestry objectives and deliverables and therefore an agroforestry support programme should be offered by both sides of DAFM (Agriculture and Forestry) and tailored as such and DAERA should consider offering it as a forest option as well as its current support. This subtle change at policy level should allow the scheme to be more flexible and, as a result, significantly increase the uptake.

We would therefore propose, as the underpinning science base is clear and the level of expression of interest and potential for support within Government is high, that agroforestry be supported as both an agricultural and forestry measure with specific layers of environmental enhancement options recognised in both.

8. Conclusions

Agroforestry has the potential to be an alternative, profitable and productive land use that could assist landowners and Ireland in meeting future climate change, animal welfare and environmental objectives (see Section 4).

In the narrative above, we have outlined in some detail what benefits we see could accrue from agroforestry, and the type of support we would like to see for the role of agroforestry in the agricultural, forestry and environmental sectors.

As a starting measure, we propose the inclusion of agroforestry as a layered option pilot project in future agri-environment schemes. Because, as suggested, payment could be offered on a per-tree basis rather than land area, agroforestry could be treated as a per-unit payment similar to a "linear payment" as per hedgerows.

We also fully support the aspiration indicated in the Programme for Government for the 'development of on-farm forestry initiatives through the new CAP, aligning agri-environmental schemes with climate change objectives and investing further in knowledge transfer. In this regard, we propose a broader and flexible agroforestry scheme as an essential component within the next Forestry Programme. With this approach, we envisage that agroforestry can be a highly attractive and successful farm support measure.

Agroforestry can increase farm livelihoods and farm resilience without negatively affecting current farm production whilst delivering a valuable array of public goods. It has enormous potential to be the tool of least resistance to meet government targets of 400 million trees planted by 2040 and to meet other goals around water quality, biodiversity, carbon sequestration and climate change mitigation.

In conclusion, we propose that agroforestry be included in forestry, agriculture and measures within environmental schemes to create the broadest possible access to a land-use system that has extraordinary scope to deliver social, environmental and economic goods, both now and into the future for Ireland.

9. References and Research Links

Selected list of relevant publications as supporting evidence for above claims for agroforestry

1. Carroll, Z.L., et al., *Can tree shelterbelts on agricultural land reduce flood risk?* Soil Use and Management, 2004. **20**(3): p. 357-359.
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4. Torralba, M., et al., *Do European agroforestry systems enhance biodiversity and ecosystem services? A meta-analysis.* Agriculture, Ecosystems & Environment, 2016. **230**: p. 150-161.
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8. Kay, S., et al., *Agroforestry creates carbon sinks whilst enhancing the environment in agricultural landscapes in Europe.* Land Use Policy, 2019. **83**: p. 581-593.
9. Zomer, R.J., et al., *Global Tree Cover and Biomass Carbon on Agricultural Land: The contribution of agroforestry to global and national carbon budgets.* Scientific Reports, 2016. **6**: p. 29987.
10. Pent, G.J., *Over-yielding in temperate silvopastures: a meta-analysis.* Agroforestry Systems, 2020. **94**(5): p. 1741-1758.
11. Raskin, B. and S. Osborn, *The Agroforestry Handbook - Agroforestry for the UK*. 1 ed. 2019, Bristol: Soil Association. 150.

ADDITIONAL PUBLICATIONS / INFORMATION

National Emissions Reduction Directive Commitments https://www.eea.europa.eu/themes/air/air-pollution-sources-1/national-emission-ceilings/national-emission-reduction-commitments-directive

Marie-Laure Augère-Granier 2020. Agroforestry in the European Union: European Parliament Briefing document. Members' Research Service. June 2020. Agroforestry in the European Union

Lundgren B.O. and Raintree J. B. (1982) Sustained agroforestry. In: Agricultural research for development: potentials and challenges in Asia. Ed. B. Nestel. INSAR, The Hague, 37-49.

European Agroforestry Federation (EURAF) policy briefings 2020. https://euraf.isa.utl.pt/node/1619

1. Agroforestry and the Green Deal tiny.cc/f8posz
2. Agroforestry in the EU Forest Strategy https://docs.google.com/document/d/1dd0-pugx92iEzlsa3CwtmqN57NIEu-5Sr_reaoFXtJg/edit#
3. Agroforestry and CAP Direct Payments tinyurl.com/y3goubg4

4. Agroforestry and Enhanced Conditionality tinyurl.com/yyx9k7fk

5. Agroforestry and Ecoschemes tinyurl.com/y327ffvv
6. Agroforestry and Pillar II tinyurl.com/y6c32f9p
7. Agroforestry CAP Monitoring tiny.cc/f8posz
8. Agroforestry For Carbon Farming tiny.cc/48posz
9. Agroforestry Policy in England http://tiny.cc/ki5htz
10. EURAF reacts to the Commission's advice on CAP SPs http://tiny.cc/ki5htz
11. EU Agroforestry Policy for a North American Audience https://tinyurl.com/u5dmj6u3.
12. EURAF reacts to the EU "Fit for 55 Package" https://tinyurl.com/3kuw7c45

There is a large body of documented research from the agroforestry programme in Northern Ireland. This mainly surrounds the establishment and early development of silvopastoral systems and much of it is in unpublished theses and reports which are not easily accessible. These have been listed and can be made available if required.