

Response to the report commissioned by the Royal Society of Edinburgh (RSE) 'Inquiry into public financial support for tree planting and forestry' (2024)

Dr Andrew D Cameron, University of Aberdeen, Institute of Biological and Environmental Sciences, Cruickshank Building, St Machar Drive, Aberdeen AB24 3UU
Email: a.d.cameron@abdn.ac.uk

Background

1. The report (<https://rse.org.uk/expert-advice/inquiries/tree-planting-inquiry/>) examines the use of public money by the Scottish Government for forest expansion based on the premise that the 'utility of trees extends well beyond their commercial value and these wider benefits such as carbon sequestration, biodiversity improvement, and recreation have become increasingly to the fore' (p4). Information was collated through an open public call for views with 45 responses from individuals and organisations.
2. The report's main conclusion is that the Scottish Government should discontinue subsidising commercial conifer planting stating that this has failed to deliver wider benefits to the public. The report proposes that financial support should instead focus on native broadleaved tree planting claiming that this will provide long term carbon sequestration, biodiversity, and public benefits.
3. How public money is spent on forest expansion is an important and recurring issue. Evaluation of public expenditure needs to be undertaken objectively and rigorously to provide taxpayers with the information they need to determine whether public funds are spent well. The RSE report falls short on both objectivity and rigour with particular concerns regarding the methodology and use of the literature that questions the validity of the findings in the report.

Methodology

4. The RSE collated information through an online survey which was open to the public and interested organisations attracting views from 45 respondents (p10)—a small sample size in survey terms. While open online surveys are widely used due to their low cost and relative ease of setting up, statisticians warn of the bias associated with this survey method due to the tendency of attracting individuals critical of the subject of interest rather than those who are supportive. This was demonstrated in a pivotal study by Duda and Nobile (2010) based on three wildlife research projects using two survey approaches—one using an open online method and the other by random sampling. Diametrically opposite outcomes were arrived at with the open online method attracting a disproportionate number of respondents with strong negative views whereas random sampling returned favourable outcomes.
5. By way of contrasting methodologies, Forest and Land Scotland commissioned a survey by Censuswide on productive forest expansion (FLS, 2021) where 1000 people in Scotland were questioned using standard statistical sampling methods (Censuswide abides by and employs members of the Market Research Society which is based on the European Society for Opinion and Marketing Research principles). The results showed that 90% of the sampled population were in favour of expanding productive forests.

6. Respondents to the RSE survey provided answers to a set of ‘standardised consultation questions’ (p14). No explanation is provided on how these questions were drafted or ‘standardised’, or whether the questions were tested to ensure clarity and impartiality. Respondents were encouraged to provide sources of evidence to supplement their answers. The combination of the sampling bias and small sample size undoubtedly influenced the balance of cited material used in the report. Almost one half of the references (48%) used in the report relate to subjects associated with climate/environmental whereas only 5% specifically refer to the commercial forestry sector/timber use (39% government/policy statements; 16% urban/community; 15% statistics/general information). Since the central theme of the report was to examine the case for public funding of productive forestry, a comprehensive and balanced synthesis of the literature is missing. This will be further examined in the sections below.

Policy context/History and nature of tree planting in Scotland

7. The report does not state the current level of public funding for tree planting to provide context (in 2023, £47 M was allocated for tree planting accounting for less than 0.001% of the Scottish budget).
8. The main recommendation to end public funding of productive tree planting is stated early in the policy section, seemingly based on selected extracts from a variety of policy documents (pp 16-20). This suggests that information presented in the rest of the report was not used in making this decision.
9. The report states that around 60% of forest holdings in other European countries are less than 1 ha whereas there are only 6% in this category in Scotland (p23). Many Continental European forests, some originating back to post glacial times, have a long history of ownership unlike the situation in Scotland where the increase in forest cover is relatively recent. The report implies that numerous very small forest plots under different ownerships is a good thing, whereas more thorough research would have shown that this pattern of ownership can lead to significant areas of forest becoming abandoned/neglected since it is not cost-effective to manage such small plots (e.g. Butler et al., 2021).
10. The report goes on to highlight that most of the grant payments for tree planting goes to private landowners (p23) but fails to point out that grant payments do not, and were never intended to, cover the costs of forest establishment requiring landowners to make significant financial contributions (~40-50% of costs) to tree planting schemes. Also not mentioned is that planting grants for native broadleaves are currently 27% higher than for productive spruce.
11. The statement is made that most new planting in Scotland is based on non-native conifers whereas in the rest of the UK more broadleaves are planted by proportion (p23). A silviculturist on the inquiry committee would have highlighted the basic fact that the geographic location of Scotland has affected a climate and site types largely unsuitable for productive broadleaved tree planting.

Current schemes and potential reform of financial support

12. The lack of a comprehensive synthesis of the scientific literature has led to several flawed conclusions in this section. Using a report from 1957 (Zuckerman, 1957) as an argument that a strategic reserve of timber is no longer required (p28) fails to take account of the fact that the world has radically changed since then with population growth more than doubling and wood demand increasing accordingly. The World Bank estimates that current global demand for timber is set to quadruple by 2050 (World Bank Group, 2021).

13. The report also fails to adequately address the global nature of timber trade. The world is running out of industrial timber with a deficit potentially by the middle of this century (Churkina & Running, 2000) raising fears that this will precipitate an expansion of logging in natural and semi-natural forests, including many of the world's most threatened tropical forests (Sedjo & Botkin, 1997; Indufor, 2012; Barua et al., 2014). Key environmental agencies such as the British Ecological Society, RSPB, FoE and WWF have all recognised the role of the commercial forestry sector in reducing both demand for imported timber products particularly from high-risk countries, and the associated environmental footprint (House of Commons, 2023). A point not highlighted within the report is that productive 'plantation' forests use land efficiently—they only cover 3% of the total global forest area yet produce one third of the world's industrial timber.
14. There is no discussion on the environmental consequences of 'offshoring' our timber needs. The report acknowledges that poor forestry and environmental practices are prevalent in some countries and proposes a solution that 'proper control of supply chains by importers and timber industries' (p28) is needed. However, this is easier said than done. Wood from countries actively involved in illegal logging of primary forests regularly finds its way into the international marketplace (e.g. Nellemann et al., 2018). While forest certification is widely acknowledged for its positive impacts on sustainable forest management, most of the world's certified forests are in developed countries (87% in Europe and North America) with limited uptake in developing countries making it difficult to control exploitation (Xu and Lu, 2021).
15. The report states that imported sources of wood products are readily available from countries with 'good environmental standards', mainly from Central and Northern Europe (p28). What is not discussed is that the current availability of imported timber may not continue into the future through rising global demand and increasing climate-induced damage. A combination of drought stress and insect attack has resulted in many European countries revising down their production forecasts and that the situation is likely to become worse (Forest Europe, 2020).
16. The report also does not discuss the long timescales involved in growing trees for timber should a global crisis arise that affects imported supplies. Decades would be needed to build up a productive supply of timber to replace imports. Importing timber, often over great distances, comes with a significant 'carbon footprint' that is overlooked in the report. There is the additional concern that in an increasingly unstable world politically, high dependence on basic resources through imports is unwise. Recent issues with gas supplies throughout Europe were a timely reminder of the vulnerability of major importing countries like the UK to global trade.
17. The statement suggesting that demand for planting land is pricing some farmers out of the market lacks context (p29). Expansion of productive forests will inevitably create tensions with other land uses, particularly agriculture. Productive tree planting tends to be located on poorer quality land, much of which has been traditionally used for upland sheep farming. The report fails to examine the contrasting economics of land use in upland areas. For example, a study in southern Scotland where the costs of maintaining hill sheep farming in Less Favoured Areas (LFA) (defined by combination of poor climate, soils and terrain, lower yields, higher production, and transportation costs) was found to require a direct payment subsidy of around 60% of output for survival, while productive forestry on the same land received a small grant contribution of around 3% of output; although the authors pointed out that these values will vary among regions (SAC Consulting, 2014).

Timber industry

18. This is the shortest section (pp 31-32) supported by only three references, which is totally inadequate to cover what is a central issue within the report. The authors use a reference from a committee (Construction Leadership Forum, 2023) stating that ‘timber processing in Scotland is largely restricted to short-life and low value products’ (p31). Based on forestry statistics (Forest Research, 2023), 72% of softwood deliveries goes to sawmills (60%) and panel manufactures (12%), both supply the higher value construction sector.
19. Building houses with a high content of timber is a well-established construction method in Scotland and is well ahead of the rest of the UK in timber frame designs with over 80% of new houses built using this method (STA, 2018). Given the lifetime expectation of 50-100 years, use of timber products in house construction cannot be described as ‘short-life and low value.’ There is no mention of the research that shows that a reduction in carbon emissions by substituting timber for masonry and concrete in building construction is around 20% and 60% respectively (Spear et al., 2019).

Carbon capture by trees

20. The report only briefly covers carbon capture by trees (pp 34-35) with only five references and these are exclusively on soils. The extensive body of literature on the role of productive forests in carbon sequestration is missing. While the report acknowledges that fast-growing species such as Sitka spruce sequester carbon more quickly than native broadleaved species, it counters this by stating that natural forests store more carbon than plantations without supporting evidence. There are numerous studies that show that productive forests are significantly more effective at removing and storing atmospheric carbon than environmental tree planting (e.g. Cannell & Dewar, 1995; Nijink, 2010; Leskinen et al., 2018; Forster et al., 2021). In addition, productive forests will continue to deliver mitigation long into the future when environmental forests will have reached their peak capacity (Forster et al., 2021).
21. A major omission in the report is discussion around the fate of harvested wood that supports a significant part of greenhouse gas mitigation potential of productive forests (Leskinen et al., 2018). Taking account of both forest growth and use of the harvested wood, a study based on these life cycle stages over a 100-year time horizon found that newly planted productive Sitka spruce forest over two harvests supported up to 269% more greenhouse gas mitigation potential than newly planted broadleaf conservation forests (Forster et al., 2021). High productivity is also a significant factor in greenhouse gas mitigation (Doelman et al., 2020; Forster et al., 2021) and is consistent with other studies indicating that expansion of the forest area using fast-growing species is the most cost-effective way to sequester carbon (e.g. Stern, 2007; Nijnik, 2010).
22. The use of ground preparation prior to tree planting is a recurring issue regarding the putative loss of soil carbon. The report is correct to point out that soil carbon can be lost at planting and that it can take several years before a net carbon sink is established; however, a more detailed analysis of the role of cultivation and soil carbon over longer timeframes is missing. An examination of the literature shows that there is a decrease in soil carbon during the first five years following afforestation, then a recovery with significant increases and net gain in carbon evident from around 30 years onwards depending on the soils (e.g. Paul et al., 2002; Li et al., 2012; Bárcena et al., 2014). Even if relatively short rotations of say 40 or so years are used, soil carbon stocks (and a large proportion of nutrients) at harvesting are replenished if most of the

residues (e.g. branches, offcuts, tree stumps) are retained on site (Jarvis & Linder, 2007), which is normal operational practice.

23. While the report states that direct planting is less destructive than deep ploughing (which is no longer done) and mounding (p34), there is no comment on the difficulties in attempting to directly plant trees into ground without some form of ground preparation due to a combination of competing vegetation and poor soil aeration resulting in inevitable losses and costly replanting). This equally applies to establishing native broadleaved species.

Biodiversity

24. The section on biodiversity is the longest in the report (pp 37-43). The narrative is primarily based around a comparison between commercial forests/monocultures (illustrated by austere photographs of dark understoreys and linear planting) versus native broadleaved woodland (illuminated by a sunny woodland glade). The report fails to examine the biodiversity associated with productive forests and the many changes to management that have taken place over the decades supporting wildlife. As with most critics of productive forestry, the report tends to look back to an era of poor environmental awareness to support their views, yet conveniently overlooks that this has long since changed. The authors of the report have failed to recognise that the longevity of forests inevitably requires time to make changes to the age-class structure, species composition, and forest landscape.
25. Most of what is recommended in the report to improve biodiversity of forests is already current forest policy. A more detailed review of the literature would have highlighted that well-implemented commercial forest management has little or no long-term environmental impact on water quality and freshwater ecology (e.g. Binkley & Brown, 1993; Nisbet et al., 2002; Shah et al., 2021). Even newly established areas of forest quickly provide a wide range of ecosystem services including improved water quality and recreation (Vesterdal et al., 2002; Zandersen et al., 2007). The establishment of productive forests can also provide natural flood mitigation (e.g. FAO, 2005; Wheeler and Evans, 2009; Wilby and Keenan, 2012), a role that needs to be better recognised given the increased incidence of severe flooding.
26. The use of non-native species is an ongoing issue that never seems to be resolved. A key argument put forward in the report is that non-native tree species are associated with poor biodiversity. A wider examination of the literature would have highlighted numerous studies demonstrating that productive forests of non-native temperate trees sustain a level of biodiversity equivalent to that in planted forests of native species (e.g. Humphrey et al., 2000; Sax et al., 2005; Smith et al., 2008; Quine & Humphrey, 2010; Irwin et al., 2014).
27. It is interesting to reflect on the contradiction in criticising non-native tree species growing in Scottish forests that cover 19% of the land area when almost the entire agricultural sector covering almost 70% of the land area is based on farming non-native plants and animals.
28. Over time, well managed productive forests can take on certain characteristics of 'old-growth' forests if longer rotations are adopted (Oliver & Larson, 1996). Extending rotation ages including 'long-term-retentions' (stands left to grow indefinitely) has been part of forest management practice for a long time (Hibberd, 1991).
29. Greater use of species mixtures is highlighted in the report (p41) but fails to recognise the importance of non-native species. Using non-native species better adapted to a changing climate, and intermixing native and non-native species, is seen as an essential part of increasing forest resilience in Europe (e.g. Bolte et al., 2009; Lindner et al., 2010; Jandl et al., 2019). Using a wider range of species is already part of current forest policy in Scotland, although the report fails to

appreciate that it takes time to ensure supplies of suitably site adapted species are available from forest nurseries and to sufficiently understand the silvicultural requirements and wood properties of alternative species.

Environmental Impact Assessment (EIA)/Urban trees/Rural communities

30. The report questions the role of EIAs in forestry developments stating that 'the EIA process is...clearly perceived as inadequate' (p46) and goes on to recommend that '...all planting proposals of 40 ha and above, or smaller applications adjoining existing woodland, submit an EIA' (p47). This recommendation appears to be primarily based on comments from three responders (*Anonymous 2, University of Edinburgh Centre for Sustainable Forests and Landscapes, Butterfly Conservation*). This is a very narrow pool of sources to draw such a wide-reaching recommendation. The wider implications of mandatory EIAs for the forestry sector have not been discussed in terms of additional administration and costs. There are also questions whether additional EIAs will have any material effect on the decision-making process since much of the content of EIAs is already included as part of planting grant applications suggesting duplication of effort.
31. The key recommendation from the brief section on urban trees is that Scottish Forestry should fund tree planting in urban areas (p49-50). While the report correctly highlights the huge value of trees in improving the urban environment, there is no evidence presented that local authorities want the intervention of Scottish Forestry in their tree planting schemes. Scottish Forestry would have to employ new personnel to cover the very different process of urban tree planting when local authorities already have professional staff with this expertise, potentially resulting in a conflict of authority.
32. The report correctly stresses the importance of community engagement in planning/land use decisions (p52-54). However, no convincing argument is presented that the current system of community engagement needs to change. Certainly, more attention needs to be given to liaising with local communities; however, the focus should be on making the current system work more effectively. Care is also needed to avoid the risk of bias based on a vocal minority who are not representative of the community leading to the same issues highlighted in discussion of the survey methods used in RSE report.

Final comments

33. While it is important to challenge how public money is used, it is equally important that taxpayers are provided with clear, unambiguous information based on scientifically robust studies. The RSE report fails on this count primarily due to lack of objectivity and rigour in the methodology, and the lack of a comprehensive review of the literature. Consequently, the findings and recommendations presented are highly selective and therefore unreliable and should be treated with caution.

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