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**Pwyllgor Newid Hinsawdd, yr Amgylchedd a Seilwaith | Climate Change, Environment, and Infrastructure Committee**

**Biodiversity and the nature emergency | Bioamrywiaeth a'r argyfwng natur**

Ymateb gan Dr Tim Pagella, Prifysgol Bangor | Evidence from Dr Tim Pagella, Bangor University

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A short paper on implementation of the COP15 International Agreement on Biodiversity

Dr Tim Pagella, Bangor University

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### Introduction

[1] I was a member of the Biodiversity Deep Dive group and I broadly endorse the recommendations of that panel. As the focus of this session is on implementation, I feel that there are some areas that I would like to emphasise in the evidence I provide at this point around achieving that agenda. Implementation requires us to distinguish between high level target setting (i.e. setting out and agreeing the broad policy agenda around implementation) and delivery on the ground (operational implementation) and the links between these two elements. Below I will set out four areas that I regard as being critically important to effective implementation.

1. The need for Theories of Change
2. Integration of Landscape perspectives (and systems thinking)
3. Building buy-in for changes in tree cover
4. Institutional capacity

[2] Very briefly as a quick overview of my expertise. I am a Forestry Researcher based at Bangor University. My particular area of expertise focuses on trees on farmland (agroforestry) and I have twenty years of experience of working with people and trees on restoration projects both in Wales, in Europe and in broader development contexts in the Global South.

### Section 1: Theories of Change

[3] The Biodiversity Deep Dive set out eight high level recommendations. These were quite broad in their focus, ranging from what I would describe as sensible iterations of existing

policy (for example 'Recommendation 3: Unlocking the potential of designated landscapes' to more ambitious recommendations e.g. Recommendation 5: Build a strong foundation for future delivery through capacity building, behaviour change, awareness raising and skills development) which begins to move us away from 'business as usual'. For implementation of the recommendations to be effective there is a need to plot an implementation pathway that a) sets out the recommendations in terms of their priority for implementation (i.e., which of these recommendations will likely deliver the most significant changes, to what degree can they be delivered concurrently and if they cannot be delivered at the same time, how will they be prioritised?) and ensuring that recommendations that steer us away from 'business as usual' are properly integrated at an operational scale (as these are likely to be harder to implement).

[4] The first draft of the post-2020 global biodiversity framework included a high-level Theory of Change to describe this process. Similarly, an adapted version of the Theory of Change was presented in the initial Deep Dive documentation. A Theory of Change is a way of mapping out the steps and connections between an intervention's actions and the intended results. It helps us understand why and how we believe the intervention will work and what assumptions we are making. This is typically done through a diagram and a written explanation that provides the context and details of the intervention's logic, as well as how we plan to measure its success. Theories of Change are increasingly important in development projects (particularly large-scale restoration projects in the Global South – where much of my research activity has focused). My advice then and now is that the recommendations needed to be integrated into an updated Theory of Change which sets out how we translate the high-level policy ambitions into operational deliverables on the ground.

[5] Critically a Theory of Change emphasises the need to identify and provide evidence for specific cause-and-effect connections between the outputs and outcomes of an intervention. It outlines the expected paths through which the intervention will achieve its desired effects and establishes measurable indicators to gauge its progress over time. Additionally, it makes a point of explicitly stating the assumptions about these cause-and-effect relationships, including an analysis of the barriers and enablers that may influence the intervention's success.

[6] The more ambitious suggestions proposed in the Biodiversity Deep Dive are likely to face several such barriers, given they divert away from business-as-usual model. A Theory of Change explicitly states what barriers are most likely to be encountered and sets out pathways to address them (i.e., it provides an explicit 'reality check'). For example, there are clear and obvious problems with delivery of the current iteration of the Sustainable Farm Scheme which seeks to impose area targets for tree cover and wildlife on farmers (strongly linked to achieving our biodiversity targets) – this is very much viewed as an imposition by many farmers and will inevitably face significant resilience. We need to explore alternative mechanisms to achieve the same outcomes and understand and mitigate for the consequence of failing to meet this target by utilising other approaches (I have suggested a shift to a landscape target below). A Theory of Change is designed to address these issues transparently to provide confidence that an intervention will have durable and transformative impact.

[7] Where we are working with a high-level programme such as this (where we are effectively setting out a national agenda for change) we also need to look at developing 'operational' Theories of Change at the scales of implementation – as 'context' is critically important in prioritising actions and varies considerably around Wales. My use of the term "context" refers to the specific conditions (both biophysical and socio-economic), circumstances, and factors that surround a particular situation or decision-making process. It encompasses the environment, background, and relevant variables that may influence or shape the options available and the potential outcomes. These operational Theories of Change work best if they are developed in participation with local stakeholders. They explicitly look at how high-level changes are then converted into changes on the ground. No such Theories of Change exist at present and there is a 'missing middle' between the stated aspirations and implementation.

[8] Whilst I have discussed this in direct relation to the delivery of the Deep Dive recommendations, I feel that having an explicit, transparent framework describing the change logic is critical for bridging between high level policy and operational scales to deliver the biodiversity outcomes through any pathway proposed to achieve these goals.

## Section 2: Actions at landscape scale (and the need for systems perspectives)

[9] Something that was also highlighted in the Deep Dive was the need to see our protected areas in their broader landscape context. The term 'landscape' is used frequently in relation to our aspirations for achieving our biodiversity objectives – and indeed is integral for enhancing habitat connectivity, for example. A landscape perspective is also critically important for understanding both positive and negative 'spill over effects' where ecological processes (and the consequences of different management actions) "spill over" from one habitat to another, influencing neighbouring areas. Monitoring and managing these spill over effects will be critical for maintaining and improving the functional integrity of the areas protected by the 30x30 goals and requires a broader focus on the habitats adjacent to those systems – in effect it requires a 'landscape' perspective.

[10] In my professional opinion we currently have very limited capacity to plan and manage at the landscape scale in Wales. We have very few people with the skill set to evaluate and direct interventions at landscape scale – nor are we strong at recognising emergent processes at those scales. This is a major institutional barrier and currently is likely to limit effective implementation. The area statements were designed, in part, to move us towards this goal but their implementation to date has not delivered against this objective.

[11] This is possibly best explained by using an example. A major concern I have is that climate change will quite rapidly drive changes in freshwater temperature across Wales: Rising temperatures can impact aquatic ecosystems by altering species composition, reducing dissolved oxygen levels, and increasing the likelihood of harmful algal blooms all of which create significant issues for biodiversity (and is an example of a negative 'spill over' effect that will impact protected areas). A relatively recent study by the Environment Agency (and others) found that enhancing riparian tree cover in headwater areas was the most effective mechanism for keeping streams cool (effectively by managing the shading regime

at source). At present tree cover in riparian areas in the headwater areas of Wales are very low and most of our catchments would be considered heavily degraded in this regard (and we have good data on this). Maintaining freshwater temperatures requires targeted tree planting in these headwater areas. At present a generic 10% tree cover target on farm does not deliver this outcome and no targeted measures exist. The adoption of a landscape perspective highlights the need for freshwater systems to be managed as a whole and enables the targeted landscape scale interventions required to achieve both the biodiversity and climate goals associated with them (by recognising that these are interconnected and interdependent systems).

[12] Framing interventions like this is also critical for local uptake of these measures—farmers and other actors are more likely to buy in to proposed interventions if they understand the rationale for the change. Generic targets (such as a 10% tree cover target on farm) make little sense to farmers whereas targeted action to achieve a specified goal helps to create a common concern entry point which improves participation that underpins the behaviour change required to deliver the goal.

[13] More broadly there is a need for systems perspectives that recognises that natural resources, such as forests, water, land, and biodiversity, are part of complex ecological and social systems that interact with each other and with human activities. Systems thinking involves explicit consideration of feedback loops, which are the mechanisms through which changes in one part of a system can influence other parts. Feedback loops can be reinforcing (positive feedback) or balancing (negative feedback). Identifying and understanding these feedback loops is essential for predicting and managing the dynamics of natural systems. While some of these feedback loops will be captured as part of our broader monitoring and evaluation many feedback loops, particularly those associated with social changes (such as drivers behind changes in management), are not typically a focus for monitoring and evaluation. Going forward it is my opinion that these are explicitly considered as part of future monitoring and evaluation activity (as set out in Recommendation 7: Develop and adapt monitoring and evidence frameworks to measure progress towards the 30x30 target and guide prioritisation of action).

### Section 3: Building buy-in for changes in tree cover on farmland.

[14] Target 10 of the Kunming-Montreal Global Biodiversity Framework sets out the need to ensure that areas under agriculture, aquaculture, fisheries and forestry are managed sustainably, in particular through the sustainable use of biodiversity, including through a substantial increase of the application of biodiversity friendly practices, such as sustainable intensification, agroecological and other innovative approaches contributing to the resilience and long-term efficiency and productivity of these production systems and to food security, conserving and restoring biodiversity and maintaining nature's contributions to people, including ecosystem functions and services.

[15] This has relevance for Wales where agriculture dominates our landscape and farmland will be critical for the future delivery of biodiversity objectives and many public goods. Central to this will be how we manage and enhance tree cover on our farmlands (through better management of our farm woodlands and hedgerows or through the expansion of

agroforestry systems). Currently tree cover outside of woodland accounts for approximately a third of our tree cover but sits awkwardly between agriculture and forestry and is largely ignored. At present our approach has been to set central targets (either national scale tree planting targets or area targets at farm scale) neither of which are satisfactory solutions (not least as they ignore context – even small areas of targeted tree planting can deliver significant changes in ecosystem function if they are planted in the right place). In my opinion both are likely to be unsuccessful, for a range of reasons, especially given our recent history of tree ‘expansion’. As suggested earlier, an area of concern is that these centralised objectives are likely to have very limited buy in from farmers which ultimately makes adoption challenging – this is an area where I have particular expertise.

[16] My strong suggestion is that instead of focusing on the tree targets we should instead focus on the behaviour change required to enable farmers and other landowners to change their attitudes to trees. Farmers can and will adopt trees on farms where they value the benefits that trees provide. To change farmers attitudes to trees it is important that our communication about trees focuses on the *in-situ* value of those trees (in terms of their ability to provide on farm functionality rather than solely focusing on the biodiversity emergency or the climate emergency which are seen as externally imposed). These functions would include shelter for livestock (both from wind and sun), soil stabilisation, soil health, and potentially diversified production (i.e., farm scale timber). All these interventions will also deliver immediate climate and biodiversity benefits (including significant below ground benefits) whilst moving farmers towards more sustainable and resilient farming systems.

[17] A shift of focus to behaviour change also recognises that adoption is unlikely to be even across all farms. There are farmers who naturally experiment and early adopters who capitalise on that experimentation. At the other end of the scale, we would expect that four out of ten farmers will show high reluctance to change. There will be little or no return from immediate engagement with these farmers. Understanding and mapping this helps with more effective and efficient delivery.

[18] Our aim should be to target those people (and areas) most likely to adopt trees; and highlight their successes (and learn from their failures). The aim is to normalise tree planting on farms so that it is something that farmers value and will do of their own accord (with support where appropriate). By changing the cultural values around trees on farm (by targeting and addressing the norms associated with them) we can completely change the dynamics around tree planting. There are several examples globally where this has happened – most notably with farmer managed natural regeneration is the Sahel. At present there are already farmers that are interested in regenerative farming practices and agroecology – we should attempt to capitalise on farmer led initiatives and work with them.

[19] Finally, there is a clear link between the need for landscape approaches and changes in tree cover. A simple shift of the 10% tree cover target from farm scale to landscape scale would provide an enhanced framework to enable farm to farm cooperation, deliver targeted changes in ecosystem function (see riparian cover in headwater section above as an example) particularly if those ‘landscapes’ incorporate upland and lowland areas – where

farmers negotiate with each other to deliver the target tree cover change. This shift of focus forces everyone to take a landscape perspective (which whilst it is a very different delivery model has several advantages over farm level implementation – not least making habitat connectivity interventions viable).

#### Section 4: Institutional Capacity

[20] All of the above have a common theme. They point to areas where currently we have limited institutional capacity in Wales. Whilst much of the emphasis has been on farmers and landowners to make the changes needed to deliver these objectives, I think it is critical that we also understand and enact the changes in behaviour required from our institutions to underpin these changes. At a time where we are actively seeking to have more trees on farms in Wales there is currently not a single person in either Welsh Government or Natural Resources Wales with the word “agroforestry” in their job title – and very limited capacity in these areas. There is very limited extension capacity to support farmers with tree planting and strong likelihood of farmers and other landowners getting mixed messages in communication around trees. In conversations I have with farmers there is very limited trust in government – and if this represents a national pattern presents a significant barrier to deliver of the COP15 recommendations. These barriers need to be acknowledged and actioned.

[21] In addition to farmer focused activity, I have highlighted the need for better systems understanding (particularly around scale) and social science specialists (who can engage with landowners around behaviour change and cultural norms). We are asking for a significant move away from business as usual and part of that discussion needs to focus on the skill sets (and capacity) required to deliver this. The farmers will only be able to deliver against this agenda with the right support in place – and this capacity is not currently there. This critically includes a shift to more participatory approaches. Again, this has become very normalised in development work in the Global South – but is largely and inexplicably absent in Europe and the UK.

[22] My final point relates to uncertainty. My impression is that policy wants to be seen as authoritative in an area where there is high uncertainty about what will work and what might not. I think it would be more helpful to acknowledge this uncertainty – and instead set out the principles that are feeding into policy design and implementation transparently and adopt a joint learning agenda that encourages experimentation and shares mistakes so that we can accelerate development of best practice.

#### Post Script

[23] I was advised not to provide explicit citations in the text I provided. I am happy to provide references that underpin the evidence I present today if required.